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THE

NATURALIST:

A

MONTHLY JOURNAL OF

NATURAL HISTORY FOR THE NORTH OF ENGLAND

EDITED BY

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WILLIAM WEST, F.L.S.
RILEY FORTUNE, F.Z.S.

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Yorkshire Naturalists' Union.

SUBSCRIPTIONS FOR 1912

are now due, and should be sent at once to the Hon. Treasurer,

H. CULPIN,
7 St. Mary's Road,
Doncaster.

The Hon. Secretaries of the Yorkshire Naturalists' Union are now **T. W. WOODHEAD, Ph.D., Technical College, Huddersfield,** and **W. E. L. WATTAM, Towngate, Newsome, Huddersfield.** Communications should be addressed to **The Technical College, Huddersfield.**

THE NATURALIST.

Communications for ***The Naturalist***, the Transactions of the Yorkshire Naturalists' Union, Exchanges, etc., should be sent, as heretofore, to

T. SHEPPARD, F.G.S.,
The Museums, Hull.

YORKSHIRE NATURALISTS' UNION.

BRYOLOGICAL COMMITTEE.

The members of the Yorkshire Bryological Committee will meet at **Knaresborough** Station at 10 a.m., on Saturday, January 27th. Members or Associates are invited. Will those intending to be present please communicate with the undersigned. Late arrivals can be met.

C. A. CHEETHAM,
Farnley, Leeds.

THE NATURALIST
FOR 1912.

NOTES AND COMMENTS.

BRITISH MYCOLOGISTS.

Apparently as a result of the paper on 'The Study of Fungi by Local Natural History Societies,' by Mr. H. Wager, F.R.S., which appeared in *The Naturalist* for October, the British Mycological Society has issued a circular to the various provincial natural history societies, asking for information relating to

SILVER LEAF.

The very serious disease known as 'Silver-leaf' (so called because the leaves become of a 'silvery' colour), which affects fruit trees, particularly the 'Victoria' plum, is now thought to be caused probably by *Stereum purpureum*, the sporophores of which appear on the dead wood of the affected trees. Observations on the following points would be valuable :—

(*a*) The distribution of *Stereum purpureum* as a *parasite* or *saprophyte* in the district.

(*b*) *The habitat*, with exact identification of the dead tree, shrub, or wood on which the sporophores are found.

(*c*) Did 'silvery' foliage occur on the tree or shrub previous to the occurrence of the sporophores on the dead wood ?

POLYPORES AND CLAVARIAS.

Many British trees are greatly injured by the growth of fungi belonging to the Polyporaceæ. Information is wanted as to :—

(*a*) The name of the tree affected ; and

(*b*) The name of the Polypore causing the injury.

A revision of the British Clavariaceæ is being made by Mr. A. D. Cotton, F.L.S., of Kew, who would be much obliged if members of Local Natural History Societies would kindly forward to him specimens of this order for identification and examination.

The local societies are also asked to furnish to the British Mycological Society particulars of any papers which have been published with regard to fungi.

THE CLUB-SHAPED FUNGI.

One of these circulars has been received by the Yorkshire Naturalists' Union. The clause relating to the Clavariaceæ or club-shaped fungi will, perhaps, principally appeal to northern mycologists, and we trust that any workers will send specimens to Mr. Cotton as suggested. For some years past the Yorkshire Mycological Committee has regularly sent specimens of these

forms to Mr. Cotton, with the result that Yorkshire has produced at least three species new to science, the clearing up of doubtful points with regard to other species, and the widening of our knowledge as to the distribution of several more.

THE STUDY OF FUNGI.

Personally we should be glad if the appeal issued by the British Mycological Society resulted in a greater interest being taken in the usually neglected study of the fungi, notwithstanding the fact that Yorkshire leads a long way ahead of any county in this respect, as was duly pointed out by Mr. Wager in his British Association address. There is plenty of scope for new work in this direction, both in the field and in the laboratory. Only a little before going to press we hear of the discovery by Mr. J. Needham of Hebden Bridge, of a Lepiota (*L. medioflava* Boud.) new to Britain. And this in a district which has probably been as well worked as any in the British Isles.

THE YORKSHIRE MYCOLOGICAL COMMITTEE.

Excepting in the case of the Clavariaceæ, there is not, we are thankful to say, any need to ask Yorkshire societies to send specimens to London or anywhere else. For years now the Yorkshire Mycological Committee has held a premier position in the country, and on the six or seven excursions held each year by the Union, and also on the field meetings of the forty affiliated societies, Yorkshire workers have regularly collected the various forms of fungi, and forwarded them to the Committee's energetic secretary, Mr. C. Crossland, of 4 Coleridge Street, Halifax, to Mr. A. Clarke, 16 St. Andrew's Road, Huddersfield, or to other members. In the seventies and eighties of last century, Dr. Franklin Parsons, The Rev. Canon W. Fowler, Messrs. G. Massee, W. N. Cheesman, W. West, T. Soppitt, and other members of the Union, were investigating the county fungi. The result of all this has been the publication of numerous important memoirs in *The Naturalist*, and in the Transactions of the Yorkshire Naturalists' Union, as well as the well-known 'Yorkshire Fungus Flora,' by Messrs. Massee and Crossland, the first, and, so far, the only county fungus flora in existence.

THE BRITISH MYCOLOGICAL SOCIETY.

Yorkshire is also proud of the fact that the British Mycological Society was founded within its borders, and on the occasion of one of the field meetings of the Yorkshire Naturalists' Union. It was on the occasion of the Yorkshire Fungus Foray at Selby, in September 1896, at which Mr. Carleton Rea and the late Dr. Plowright had been invited to attend, that the question of a British Society was brought to a head, and most, if not all, of those present became members.

Though this is generally known amongst mycologists, we place the fact on record, as in two or three instances recently the point does not appear to have been quite clear, in one case even the place and origin of the society was stated to be in another county.

EAST RIDING NATURE STUDY.

The East Riding Nature Study Association held its ninth annual meeting and Conference at Beverley, on December 2nd, and there was a large attendance of teachers from all parts of the Riding, and others interested in the nature study movement. Prof. J. H. Priestley, B.Sc., F.L.S., of the Leeds University, gave an admirable lantern lecture on 'The Relation of Insects to Flowers,' which was precisely of the type that was required by the teachers. The Hon. Secretary, Mr. W. J. Algar, (Lockington), presented his annual report, which contained particulars of a good year's work. The Rev. Canon Nolloth, D.D., occupied the chair. There was an excellent exhibition of nature study books, including a fine show of the publications of the Yorkshire Naturalists' Union, by Messrs. A. Brown & Sons.

METALLURGY AND ENGINEERING.

In an address delivered to the Durham Philosophical Society 'On the Mutual Development of Metallurgy and Engineering,'* Prof. Henry Louis refers to the progress made in smelting, etc., since the days of ancient Rome and Greece. He pointed out that probably before Roman times iron-smelting was carried on by a built-up furnace five or six feet high, the front wall of which would be taken down to allow the lump of malleable iron produced to be taken out. Such furnaces are still in use in Africa, India, Brazil, etc. In Roman times, if not before, iron was smelted in this country as far south as the Weald, and north as far as the Tyne. Lead was also made by the Romans, both in Yorkshire, Derbyshire, etc., and pigs with the words 'Ex Arg', *i.e.*, de-silverised, are not uncommon. Many other interesting points bearing upon early metallurgy are given by Prof. Louis in his paper.

HISTORY OF FOSSIL BOTANY.

In his Presidential Address to the Linnean Society, Dr. D. H. Scott refers to 'A Chapter in the History of Fossil Botany.' He deals with that interesting period about the year 1830; the period of Witham and Cotta, and of the earlier work of Brongniart. As Dr. Scott points out, whilst some of the opinions then expressed may appear crude and fantastic, on the other hand, it is surprising what a great advance had been made at that early time. It is shewn that the problems of the early investigators in Fossil Botany were essentially

* Proc. Univ. Durham Phil. Soc., Vol. 4, pt. 2.

those of the workers of to-day ; and the spirit in which those early students approached them might well be emulated to-day. And even at that early period the spirit of evolution was in the air, and even to-day workers find themselves in complete sympathy with the palæontological studies that were being carried on at the time when the ' Beagle ' had scarcely started on her momentous voyage. The following translation of a passage from the Introduction to Brongniart's ' Histoire de Végétaux Fossiles,' which was published in 1828, and is quoted by Dr. Scott, might almost have been written yesterday.

THE STRUCTURE OF FOSSIL PLANTS.

' Everyone will readily admit that anatomical characters, those which relate to the intimate organisation of the plant, have more value than the external forms ; it is to these characters, then, that we ought to attach the most importance when one is able to observe them, and when one cannot do so, one should seek to discover in the external form of organs, such modifications as may, so to speak, be the expression of the internal character, and may enable us to form an estimate of its modification. The nutritive vessels, forming the framework which determines the relations of position and often even the form of organs, are evidently more important than the parenchyma which surrounds them, and which may mark the most essential characters of an organ. The mode of distribution of the vessels alone may put us on the track of the true affinities of plants. Their arrangement is consequently the principal thing to observe in each organ.'

LEAVES OF CALAMITES.

From Mr. H. Hamshaw Thomas we have received a paper ' On the Leaves of Calamites ' (Calamocladus Section), reprinted from the ' Philosophical Transactions of the Royal Society of London,' a publication which has contained so many of the classical papers on Palæo-botany. Mr. Thomas's memoir is largely based on the work he has done with the microscope on material discovered from the Halifax Hard Bed—a bed which from the fact that its contained fossils retain their structural details, has proved a veritable mine of material for the worker in Fossil Botany. In an elaborate and detailed manner Mr. Thomas throws some light upon the question of the primitive megaphylly or microphylly of the Equisetales, and on their relationship to the other members of the Pteridophyta. The relationship of the Calamites to the Sphenophyllums is further brought out in the structure of the young stems and twigs he describes. The steles of the latter were almost invariably triarch, and the author shews that this was also the case in some Calamites. This paper admirably shews that there is

much palæobotanical work still to be accomplished, even in so well-known a field as the Halifax Hard Bed.

A NEW BRITISH POLYZOON.

Another profitable field for work is amongst the Polyzoa, and we are glad to find that the steady work of Mr. J. Thompson, of Hull, is giving good results. In the 'Transactions of the Royal Society of Edinburgh' (Vol. XLVII., part 4), Mr. James Ritchie describes and figures 'An Entoproctan Polyzoon (*Barentsia benedeni*), new to the British fauna.' This was found by Mr. Thompson, at the St. Andrew's Dock Extension, Hull, growing on the surface of *Membranipora* which clothed the under sides of horizontal timbers supporting the piles, and on the timbers themselves.

NOMENCLATURE AGAIN.

As a sidelight upon the difficulties as regards Nomenclature, Mr. Ritchie's researches in connection with this polyzoon lead him to conclude that *Arthropodaria* Ehlers, is synonymous with *Gonypodaria* Ehlers, and both are included in *Barentsia*. *Gonypodaria nodosa* Lomas, is synonymous with *Barentsia gracilis*, and so is *Pedicellina belgica*; whilst *Barentsia benedeni* and *B. gracilis* are distinct. *Benedini gracilis* at one time or another has rejoiced in the following names:—*Pedicellina gracilis, Forbesia gracilis, Pedicellina belgica, Ascopodaria gracilis, Ascopodaria belgica, Gonypodaria nodosa, Barentsia gracilis,* and *Barentsia nodosa*. Our sympathy is certainly with the specialist, when asked by the student, 'what is this?'!

GLACIAL GEOLOGY OF NORFOLK AND SUFFOLK.*

Under the above title has been published an interesting account of the geology of one of the most interesting of the glaciated districts in Britain, by the veteran, Mr. F. W. Harmer. Mr. Harmer is the author of many valuable memoirs on this area; but they are usually of a technical nature, and can appeal only to the specialist. We therefore think he has been well advised in reprinting this chatty and clear account of the district he knows so well, from the publications in which his notes first appeared, viz., the 'Transactions of the Norfolk and Norwich Naturalists' Society. An excellent map and several illustrations accompany the pamphlet, which has points of interest far out-reaching the district with which it deals.

YORKSHIRE NATURALISTS' UNION.

There were greater changes than usual at the Annual Meeting of the Yorkshire Naturalists' Union held at Heckmondwike, on December 16th. Mr. Sheppard resigned his

* Jarrold & Sons, 10 Warwick Lane, E.C. 1/- net.

position after nine years as Hon. Secretary, though he retains his editorial duties in connection with 'The Naturalist' and the Union's Transactions. In future, the secretarial work will be carried on by Dr. T. W. Woodhead and Mr. W. E. L. Wattam of Huddersfield. Mr. J. W. Taylor, the well-known malacologist, occupies the presidential chair during 1912.

VALUABLE YORKSHIRE MAPS.

It is well known that the late J. R. Mortimer, the Driffield Antiquary, was an authority on the prehistoric and other earthworks of East Yorkshire, and during the past half century has made a careful survey of all that remains relating to the military and domestic life of these early people, a subject upon which he has written many important papers. Several of the structures which were known to Mr. Mortimer forty or fifty years ago, or less, have since entirely disappeared, as a result of agricultural and other operations. Fortunately Mr. Mortimer carefully recorded his observations upon a large series of ordnance maps of the district, and also particulars of the barrows, the Roman remains, the pits from which he obtained his geological specimens (most of which are now closed), etc. This valuable collection of maps has been generously presented by Major Mortimer to the Municipal Museum, at Hull, where it can be referred to by students and others interested. In addition are large numbers of sketches, plans, photographs, negatives, etc., bearing upon East Yorkshire Antiquities.

UROCYCLUS ROEBUCKI.

If proof were needed of the influence of the work of Yorkshire Naturalists far beyond our own shores, it is found in the quite spontaneous honour which Dr. H. Simroth, the greatest continental authority on slugs, has sought to confer upon Mr. W. Denison Roebuck, in his 'Lissopode Nacktschnecken von Madgaskar den Comoren und Mauritius' a reprint from 'Voeltzkow's Reise in Ostafrika in den Jahren, 1903-1905, band 2.' published in 1910. During this expedition a large and conspicuous slug was discovered in the island of Pemba, off the coast of British East Africa, which has been described in the above work by Dr. Simroth, on pp. 595-596, and is illustrated by a coloured plate and text figure. To this new species he has given the name of *Urocyclus roebucki* Simroth, and says, 'I name this species in honour of Mr. Roebuck for the great services he has rendered to the study of slugs.' For thirty years Mr. Roebuck has been at work on this subject, and our knowledge of the occurrence and distribution of at least a third of the British species is due to him. No one knows the British slugs better, nor has a more intimate and practical knowledge of their distribution.

WATER VOLES MAKING NESTS ABOVE GROUND.

SYDNEY H. SMITH,
York.

During a ramble on Skipwith Common in May last, I noticed a curious example of adaptation to environment in the case of the water vole. In the swampy neighbourhood of the black-headed gullery there are numerous water voles, and as it is impossible for them to excavate their usual underground runs without their being promptly waterlogged, the voles have

Photo by] [*Sydney H. Smith.*

Nest of Water Vole.

adapted themselves to circumstances, and in place of their burrows have built comfortable nests in the tufts of sedges. These nests are skilfully woven from the white pith that fills the interior of the sedge, the outer green bark being deftly peeled away and discarded; the complete nest is spherical in shape, and is entered through a hole in the side. Close search revealed a considerable number of the nests, and although I was not fortunate enough to find one containing young, my friend, Mr. E. W. Taylor, discovered one with six young ones at a later date.

NOTES ON THE CRETACEOUS FOSSILS IN THE EAST YORKSHIRE DRIFT.

J. P. J. RAVN,
Geological Museum, Copenhagen.

For some years geologists in East Yorkshire have been familiar with fossils, in pink and black flint, which occur in large numbers in the glacial gravels and clays of East Yorkshire, and, to a smaller extent, in North Lincolnshire. These are usually flint casts of echinoderms of various species, but in addition are inocerami, sponges, and belemnites. There are likewise in the drift large numbers of a belemnite, of the *mucronata* or *lanceolata* type, with a very deep alveolus. Whilst a few of these occasionally occur embedded in black flint, they usually are found separated from the flint or chalk. and are generally in very good condition. Not only are these fossils totally different from anything that occurs in the chalk of the north of England, but the black and pink flint, which is so common in the drift, and in which the specimens are often embedded, does not occur in the Yorkshire or Lincolnshire chalk at all.

In the museum at Hull, which is apparently the home for East Yorkshire geological specimens, there is a fine collection of these derived fossils, and the curator, Mr. Sheppard, has enabled me to examine a representative collection therefrom. In these the flint has a very great resemblance to that occurring in the Danish 'Skrivekridt,' *i.e.*, chalk with *Scaphites constrictus*, which is the same age as the Trimmingham Chalk of East Anglia.

As regards most of the specimens, this resemblance is so very close, that it is possible to believe they were really derived from Denmark. On the other hand, the fossils, with the exception of a few examples, belong to species which neither occur in our Skrivekridt nor as erratics in our Quarternary deposits. They would therefore appear to be derived from strata older than the Danish Skrivekridt.

Of the species submitted, only the *Belemnitella mucronata* and the *Echinocorys ovatus* are found in Denmark, where they are very common in the Skrivekridt ; in other countries they also occur in older beds. The specimens found as boulders in the Danish drift are precisely similar in character and in a similar state of preservation to the East Yorkshire specimens.

Taking all into consideration, it seems more than probable that the flint casts, etc., in the East Yorkshire drifts are derived from deposits situated in the northern part of the North Sea, as if the beds in which the fossils occur were in the vicinity of the Skager Rack we should find the fossils as boulders in Jutland; but this is not so.

Of foreign boulders from Cretaceous deposits only Neocomian and Gault are found in the northern part of Jutland, and their homestead is considered to be the bottom of Skager Rack.

MARINE BIOLOGY AT SCARBOROUGH.

ARNOLD T. WATSON, F.L.S.,
Sheffield.

Owing to the necessity of going to press somewhat earlier than usual, a number of specimens, mainly polychæte worms, which turned up and were identified after the Meeting, were unavoidably omitted from the lists published in the December number of 'The Naturalist.' In order that the Scarborough record may be as complete as possible, it is desirable to give the following supplementary list:—*Autolytus pictus* Ehlers (rec.); *Syllis armillaris* (*Ioida*) (rec.); *Eulalia viridis* Müller (rec.); *Phyllodoce lamelligera* Gmelin (rec.); *Polydora cæca* Oersted (rec.); *Stylarioides* (*Trophonia*) *plumosa* Müller (rec.); *Potamilla torelli* Malmgren (rec.); *Fabricia sabella* Ehr.=*Amphicora fabricia* (rec.); *Polycirrus aurantiacus* Grube (rec.).

In addition to the above, an exceptionally interesting Phyllodocid worm, most closely allied to a Canadian species of *Eteone*, but possessing several special features of its own, was found by Dr. Irving. This specimen has been forwarded to Prof. McIntosh, who has kindly undertaken to describe it in his 'Notes from the St. Andrew's Marine Laboratory,' which will in due time be published in the 'Annals and Magazine of Natural History.'

An addition to the List of Polyzoa has also to be made, as I was fortunate in finding the interesting little eight-tentacled species, *Valkeria tremula*, amongst my captives.

It may, perhaps, be of interest also to add a few words about the minute Gephyrean, *Phascolosoma* (=*Petalostoma*) *minutum* Keferstein, to which reference is made at the close of last month's report.

This specimen was found embedded between the sand-tubes built by the polychæte worm, *Sabellaria spinulosa*. It is one of the smallest Gephyreans yet described, being only about three-eighths of an inch long, and, though it has previously been recorded from the North Coast of France, Heligoland, the Swedish Coast, and from Plymouth, it does not appear to have been found elsewhere on the English or Scotch Coast.

In 1908 a specimen of this worm came into the hands of Mr. Rowland Southern, B.Sc. of Dublin, who described it in the 'Irish Naturalist,' (Vol. XVII., p. 171), as 'A New Irish Gephryean.' He informs me that he has since found it in considerable numbers at various parts of the Irish Coast, and down to 500-600 fathoms.

Since the Scarborough Meeting, nine other specimens have been found there, probably, therefore, its escape from more frequent observation is due to its diminutive size.*

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* Attention has been called to some misprints in the original Vermes List: *Andoninia* should be *Audouinia*, and *Pomatoceras* should read *Pomatoceros*; and *Pleurobranchus pumilus* should be *P. plumulus*.

BOTANY.

Abundance of Wild Fruits in the Harrogate district.—There has been an extraordinary abundance of wild fruits in this district, during the autumn of 1911. Acorns I never saw so plentiful, the ground under the trees has literally been carpeted by fallen acorns, many of unusually large size. Sweet chesnuts have ripened for the first time for many years, and in one wood I am familiar with the ground was covered with the fallen fruit. The wild rose trees have had an abundance of fruit, but the hawthorns have been deficient. Walnut trees have been laden with fruit, and holly trees are at the present time one mass of red berries.—R. FORTUNE, Harrogate, Nov. 1911.

BIRDS.

Black Redstart in Yorkshire.—On October 18th, 1911, a single specimen of the Black Redstart—a male—was seen near Knavemere in the upper part of the valley of the Hodder. The bird was tame, and allowed the observer to approach within a few yards. The black breast and white patches on the wings were very noticeable.—M. N. PEEL, Newton-in-Bowland.

Uncommon Birds at Hebden Bridge.—On November 21st a Little Auk, ♀, was picked up alive at Blackshawhead, near Hebden Bridge. It had been seen in the neighbourhood for three or four weeks, and was often 'put up' from a small pond which had formed in a field. On November 23rd, a Rough-legged Buzzard, ♀, was shot in the act of killing a fowl at Shackleton Hill, near Hebden Bridge. The taxidermist informs me that the specimen weighed 2 lbs. 10½ ozs., was 23 inches long, and 4 feet 7 inches across the wings. Its stomach contained the remains of a fowl and a weasel. My records show that some of both species have been obtained at Hebden Bridge before, but not during the life of the Literary and Scientific Society. I saw a party of half-a-dozen Bullfinches, ♂ and ♀, in Spring Wood, on November 25th. This species is of very rare occurrence here now, and has not been known to nest for many years.—WALTER GREAVES, Hebden Bridge.

ENTOMOLOGY.

A Rare Parasitic Hymenopteron at Pilling Moss, near Garstang, Lancashire.—While collecting Coleoptera on Pilling Moss, near Garstang, in August, I came across several specimens of *Choreia inepta* Dalm., one of the Chalcididæ, a family of parasitic Hymenoptera. I am indebted to the kindness of Mr. Claude Morley for the identification of the species. The specimens were found on shaking the old nests of sea-gulls, with which Pilling Moss abounds. Although first recorded as British as far back as 1833, by Westwood, the species is still comparatively rare.—J. RAY HARDY, Curator of Entomology, Manchester Museum.

THE 'NEW' BOTANY.

Types of British Vegetation, edited by **A. G. Tansley, M.A., F.L.S.** With 36 plates, 8vo, pp. xx., 416. Cambridge University Press, 1911. Price 6/- net..

Ever since Richard Jefferies and other Papas of the *plein air* doctrine took us, with their enthusiasms, into the wild, there has been a growing vogue towards the beatification of country things. It has of late crept into our Fiction. On the other hand, since 1904, from the perhaps almost too strictly Academic side of Botany, following the late Robert Smith, Messrs. and Doctors of Love-Wisdom, F. J. Lewis, C. E. Moss, W. M. Rankin, W. G. Smith, and others, including our York men W. B. Crump, S. Margerison, Geo. West, and T. W. Woodhead—*not* all official members of the 'Central Committee,' the work of Systematic Vegetational Survey, with more or less expert eyes, has gone on: the well-digested and ably arranged result being this tome of 'Types'! The work of all those named above is not proclaimed aloud, but it is there, for those who know, nevertheless. It makes a difficult book to review, since with neither desire to pick, nor possibility of picking holes in the fabric—the wonderful, living carpet of Nature, there is little but a sort of struck-dumb praise to be accorded!

The materialising of the work must have been as tiresome at times as at others most fascinating; but for one angel of Light to aid: photography to the Rescue, as 'Every Picture tells a Story,' and really greatly enhances the value of the book, which no doubt will presently be in the hands of every Council School Teacher who takes his Nature-Class into the open. 'Types,' I think, must ultimately become *the* availing classic of its subject, and is certainly much better adapted than any other Manual I know for enabling the rank-and-file field-naturalist to find the excelsior charm in *understanding* what he sees, all seasons alike, whenever he takes his walks abroad.

Space will hardly allow of quotation, but there are two dainty data one must allude to as samples of interdependences marvellously inspiring to the mind. On pages 105-6, discussing the spread of the golden gorse on a lingmoor, attention is drawn to Weiss's observation of the part insects may play in dispersal: the partiality Ants shew for the seeds of the *Ulex*, carrying them off for the bright orange oily caruncle 'which they bite and tear as they push the seed along.' Again on p. 151, the *amity* (as it were), which exists between the 'complementary association' (as Dr. T. W. Woodhead called it), of Dog's Mercury and Gloriless Moschatel, often seen on dryish Dell-drained wood slopes. The Mercury roots strike down to a lower layer of soil than the Adoxa, its delicate superficial shoots receiving the shade and protection it must have from the relatively Brobdignagian proportions of Mercurialis. The roots of the two species are said to be 'edaphically complementary,' and the shoots seasonally complementary because by Midsummer, Adoxa has wilted modestly away for its nine months' period of dormancy.

Critical fault-finding must be conspicuous by its absence. Well proof-read, and fully indexed, there are only three unimportant errata; and one omission—a neglect to acknowledge W. B. Crump as the contributor of the six beautiful photographs making up plates 9, 13, and 25. The work of Dr. T. W. Woodhead seems rather inadequately referred to on p. 151, in the curt phrase 'What Woodhead terms'! But, indeed, the work is full of brand new terms as befits a brand new botany; the suffix *tum* (?) Aryan root *tu* (place set apart for), on the plan of Arboretum, I suppose, is done to derision almost; Callunetum, Fagetum, Nardetum, Quercetum to indicate the type or dominal factor in a natural or planted association over a tract, is a terminologic innovation, the wit of which lies in its brevity, one must suppose, since it is not beautiful.

F. A. Lees.

1912 Jan. 1.

SOME NEW BOOKS.

HISTORY AND TOPOGRAPHY.

Yorkshire Moors and Dales, by **A. P. Wilson.** London: A. Brown & Sons. 236 pp., price 10/6 net.

Perhaps a better idea of this book can be gathered from its sub-title, 'A Description of the Moors in North-East Yorkshire.' It goes without saying that the printing and general 'get-up' of this volume is all that can be desired. It is in clear large type, on thick paper, and the plates are well produced. The book is of the better-class guide-book type, and is evidently the author's impressions after visiting the districts he describes, supplemented by information from the guide-books and local histories. It is in three parts; the first deals with the north-west, central and eastern moors of north-east Yorkshire; the second refers to the moors and the moorland roads, dalesfolk and their customs, farming, wild nature, grouse, dialect and place names, etc.; the third section has four yarns, on 'A Bullock Deal,' 'One Prophet More,' 'A Family Feud,' and 'Rodger Dick.' We like the first two parts the best, though the chapter on 'Wild Nature' is by no means the most satisfactory, and we feel sure the adder is made to be far more fearsome than really is the case. Amongst the illustrations are Falling Foss, Guisborough Priory, Arncliffe Woods, Rievaulx Abbey, Robin Hood's Bay, the Lastingham Crypt, Rosedale, etc. Readers of this journal (and there are many) who visit this charming country, will find Mr. Wilson's book a pleasant companion. We are glad to notice that the author has not yielded to the temptation to open some of the barrows in the district, believing that this work should only be done by experts.

Nooks and Corners of Yorkshire, by **J. S. Fletcher.** London: Eveleigh Nash. 304 pp., 2/6 net.

This book is of a handy size, and with rounded corners; evidently for use in the pocket, and has a useful map. The fact that it is by Mr. Fletcher is a guarantee of its reliable and chatty nature. It deals with the Great North Road, the River Aire, Derwent, Wharfedale, Nidderdale, Wensleydale, Swaledale, the Greta and Teesdale, North-East Yorkshire, the Calder and Colne, Sheffield, the Ribble, the Coast, and the East Riding. In fact the volume may be said to be a summary of the well-known 'Picturesque History of Yorkshire,' by the same author. He begins well by giving a list of 'Some Inns and Hotels in Yorkshire,' enumerating eight for Ilkley, two for Hull, and two for York. The work is carefully planned, and will be useful to the tourist visiting the broad-acred shire.

Yorkshire Folk Talk, by the **Rev. M. C. F. Morris, B.C.L., M.A.** Second Edition. London: A. Brown & Sons. 438 pp., 4/6 net.

We are glad to be able to call attention to a second and cheaper edition of Mr. Morris's scholarly work, a work which takes a prominent place amongst those dealing with the folk speech of our country. The author is by no means a mere compiler, but has got his information first-hand from the people he so charmingly describes and amongst whom he has spent the greater part of his life. And the book is illustrated by such a large series of stories and quaint sayings that it is bound to be even more popular than its predecessor, especially as the glossary contains no fewer than 600 phrases and words more than were in the first edition. We are tempted to quote many examples of Mr. Morris's illustrations of stories and dialects, but the following, which explains how a countryman in Holderness accounted for the butter being too salt, must suffice:—

'Whya, t' wasp teng'd t' dog, an' t' dog hanched at t' cat, an' t' cat ran owerquart t' staggarth an' flaay'd t' cockerill, an' t' cockerill fligg'd ower t' wall an' flaayed yan o' t' beeos, an' t' beeos beeal'd an' stack it heead thruff t' dairy windther an' flussthered t'lass] seea awhahl sha let t' sau'-kit tumm'l inti t' kennin' o' butther.'

The glossary alone occupies nearly 200 pages, and is most valuable.

The History of the Castle of York, by **T. P. Cooper.** London: Elliot Stock. 379 pp., 12/6 net.

Some time ago we had the pleasure of drawing attention to Mr. Cooper's excellent book on 'York, the Story of its Walls, etc.' The present is a fitting companion thereto, and has been written in the same thorough and painstaking manner, and, like its predecessor, contains much valuable and new material as a result of the author's own researches. Only those who have attempted to get a reliable and connected account of the history of the Castle, from the various and numerous Histories of York already in existence, can appreciate to the full the amount of new matter that Mr. Cooper has been able to bring forward. It is evident from the Preface that the author is on good terms with the various York authorities, who have rare documents and records in their charge, otherwise the book could never have been so complete. The chapters deal with the Norman origin of the Castle; the Plantagenet Period, a detailed description of the castle and its site; Early Assise and Prison Records and Punishments (the latter being delightfully varied!); the Castle-guard; Mills; the Chapel of St. George; the ruinous state of the Castle in the fifteenth and sixteenth centuries; the Royal Mint in the Castle (an unusually interesting chapter); Clifford's Tower; Scaffolds; Great Elections, etc. (including an interesting account of the Wilberforce—Lascelles—Milton election, which cost the houses of Harewood and Wentworth alone over £200,000), and so on. There are also numerous valuable appendices. We must congratulate Mr. Cooper and the publishers in producing so sound and so readable a record of Yorkshire's 'strong point.'

The Ruins of Fountain's Abbey, by the **Rev. A. W. Oxford,** with illustrations by **J. R. Truelove.** Oxford: Henry Frowde. 245 pp., 3/6 net.

The first 125 pages of this little book form 'an attempt to put in simple language for the unlearned the results of the investigations of the ruins made by Messrs. W. H. St. John Hope and J. Arthur Reeve. To make it easy to understand, architectural terms have been explained, Latin quotations translated, and a few facts given about the life and habits of the early monks.' The rest of the volume is occupied by translations of Serlo's 'History of the Abbey and of the Chronicle of the Abbots.' As such it answers its purpose, though we are not aware that it contains more than is to be found in any of the many works dealing with this fine ruin. It is, however, particularly well illustrated by blocks from Photographs and sketches. It is printed on thin paper, on small pages, and will easily go into the pocket. The price is sufficient, and there is no index.

A Bibliography of Sheffield and Vicinity, Section I. to the end of 1700, by **W. P. Freemantle.** London: Simpkin, Marshall, etc., 1911. 285 pp., price 10/6 net.

We cannot too heartily commend the way in which scholars in our different cities and towns are carefully compiling lists of local works for the benefit of the future historian and antiquary. This is now being done in many places, but we do not remember having previously seen it done so well and so thoughtfully as is the case with this 'Section I' of the Sheffield Bibliography; albeit the 'vicinity' is a wide one. Probably few were previously aware of the wealth of material bearing upon the history, etc., of Sheffield. Mr. Freemantle has unquestionably most assiduously searched for every scrap of information bearing upon the district he knows so well, which has resulted in a volume of over 280 large pages of closely printed matter; and this up to the end of 1700 only. The book also is not a mere list of titles, but is full of valuable biographical and historical details, and in addition is illustrated by a large number of reproductions of quaint title-pages and curious woodcuts; the view of Hell (?) page 171; and of 'the passage of Thomas, late Earle of Strafford, over the river of Styx,' being particularly noticeable. Mr. Freemantle has certainly placed students under a deep debt of gratitude for his work.

An Introduction to the Study of Local History and Antiquities, by **J. E. Morris** and **H. Jordan.** London: G. Routledge. 400 pp., 4/6.

In this admirable Handbook the authors have prepared a volume which gives a general idea of local history and antiquities. It is really the outcome of the Circular issued by the Board of Education in 1908. As the authors point out, it frequently happens that a teacher interested in any particular phase of history, is likely to give a wrong idea of proportion to his scholars. The present work is an admirable summary of Pre-Celtic and Celtic Britain; Roman, Anglo-Saxon, and Norman England; Mediæval England, Wales, and Scotland; Mediæval Ecclesiastical England; Commercial, Industrial, and Domestic England; and Tudor and Stuart and later England. The book is prepared in such a way that a teacher or scholar can get useful local illustrations, no matter in what part of the country he may be situated. The book also is anything but the 'dry as dust' variety, and is an exceedingly readable and instructive narrative of the many antiquities and historical features of Britain. There are also several fine illustrations of earthworks, Roman and Mediæval remains, etc., carefully selected from the more remarkable of their kind. The book is all that it professes to be, and is remarkably cheap.

England before the Norman Conquest, by **C. Oman.** Methuen & Co. 658 pp., 10/6 net.

This is the first of a seven volume 'History of England,' and deals with the important period prior to the Norman Conquest. It is the most complete and circumstantial account of the early history of these islands that we have yet seen, and contains information which otherwise would require the perusal of a whole library of books and pamphlets. In his work the author has had the assistance of Prof. Haverfield and other experts on the various periods to which he refers. At the outset he very clearly draws the line between geology and history. He then deals in a masterly manner with the Neolithic and Bronze Periods, and the Celts down to the Invasion of Julius Cæsar. Of this usually neglected and little known period Mr. Oman is particularly clear and interesting. He then traces the course of events during the Roman occupation, and so on, through Saxon and Danish times. Each period is dealt with most thoroughly. On the question of the historic Battle of Brunanburh the author is very definite that it cannot have taken place in the Humber district, but was probably fought on the north-eastern side of Solway Firth. This is a little embarrassing to the dozens of authors who have written on the subject, and practically all of whom have definitely 'located' the site at one or other locality in Yorkshire or Lincolnshire! Mr. Oman gives a wealth of references to papers and other sources from which he derives his information, so that the student can follow up any particular point that he desires. There are excellent maps of Roman Britain, England about the year 730 A.D., England about 910 A.D., etc.

Family Names and their Story, by **S. Baring-Gould.** London: Seely & Co. 432 pp., 7/6 net.

There is always a great field for speculation as regards the origin of place-names and family-names, and whilst in the present handsome volume the versatile author has accomplished much in getting together a wonderful amount of information on the subject referred to in the title, certainly far more than has previously appeared within a single cover, we cannot yet say the matter is final, or that other theories or ideas will not be brought forward. Our surnames are at least 300 years old, and many are twice that age. As Mr. Baring-Gould points out, spelling was always tentative and capricious, and Smith, perhaps the commonest, was Smeeth, Smythe, Smeyt, Smyth, etc.; and Faber, the blacksmith, became Fever, Feures, Ferron, and Fieron. Because of the arbitrary way in which the names were recorded, so many are unintelligible to-day. Similarly the owners of some of the best of our family names treat them so strangely as regards

pronunciation, that the result is many apparently vulgar and puzzling nicknames are found amongst us—some of which are quite meaningless. *Mainwearing* becomes Mannering; *Leveson-Gower* is pronounced Lewson-Gore; *Marjoribanks* is Marchbanks; and *Cholmondeley*, Chumley. These and many other interesting phases of the subject are dealt with in the volume, and then the subject is treated exhaustively under trade-names, place-names, Scandinavian names, French names, nick-names, etc. There is a valuable series of appendices giving the names in various old documents, etc., and finally an elaborate index to the whole volume. On trying to ascertain the origin of the names of some of the editors and referees of *The Naturalist*, 'Family Names' is partially silent! Except that the fore-elders of one kept (black ?) sheep, and another was in the 'clothes' line, we can gleam but little information!

The Pronunciation of English by Foreigners, by **G. J. Burch, M.A., D.Sc., F.R.S.** Oxford: Alden & Co. 110 pp., 3/- net.

This is a series of lectures, on the Pyhsiology of Speech, delivered to the Students of Norham Hall, and is a remarkably clever book, and one that will appeal strongly to any interested in languages and their pronunciation. The author carefully points out the characteristics of the speech of the inhabitants of different countries and points out the way in which this can be remedied. For instance, in Denmark, 'there is a strong tendency, especially in Copenhagen, to omit consonants before fricatives;' thus 'a damp warm day' becomes 'a dam' warm day,' and so on. There are numerous diagrams, and 'examples.'

Black Tournai Fonts in England, by **C. H. Eden.** London: Elliot Stock, 32 pp., 4to, cloth, 5/- net.

In the latter part of the twelfth century a number of solid blue-black marble fonts were made in the province of Hainault in Belgium, the stone being quarried near Tournai. The rock, from samples sent to us, seems to be dark Carboniferous Limestone. These fonts, which had quaint designs, were sent to various churches in France, Belgium, and England. Examples occur at Winchester Cathedral and other places in Hampshire; at Lincoln Minster and Thornton Curtis in Lincolnshire; and at St. Peter's, Ipswich. These have previously been described in various places; but the author has now brought illustrations and descriptions together under one cover. We draw attention to the matter as it is possible other monuments of this period may occur in some of our churches, which may be identified as emenating from the same source. The illustrations are remarkably good.

The History of the Spur, by **C. de Lacy Lacy.** London: The Connoisseur, 95 Temple Chambers. 82 pp., 4to, price 10/6 net.

In this volume the author gathers together much reliable information in reference to the growth and evolution of the spur, from the short nail-like spike of Roman times, to the 'prick' spur of the eleventh and twelfth centuries, and the rowelled spur of more modern times. By a large series of illustrations he shews the different types in use in various periods, obtained from museum specimens, ancient tombs, etc. He also gives examples of foriegn spurs, and what may be termed 'freak' spurs. The subject is dealt with in a thoroughly scientific manner, and in many cases the author shews that this important branch of antiquities has been neglected, and specimens wrongly described and labelled, even in our national collections. He has drawn information from many sources, and has ransacked the provincial archæological publications for examples. This is apparently the first book entirely devoted to this subject. We can find no reference to the famous Ripon rowels, and there is no index.

The Flight of Birds, by **Giovanni a Borelli,** is No. 6 of the ' Aëronautical Classics ' published by The Aëronautical Society, by Messrs. King, Sell and Olding, Ltd., 27 Chancery Lane, W.C., at 1/-.

This is a report of Borelli's remarkable work on the flight of birds, which was printed in the seventeenth century, and in addition there is a useful Biographical notice of this early writer.

Bird Protection and the Feather Trade, by **Dr. A. Menegaux,** of the National Museum of Natural History, Paris (Sampson, Low, Marston & Co., 32 pp., 6d.), is from the original article published in the *Bulletin de la Société Philomathique de Paris,* and is a careful account of the great harm to bird life as a result of the demands of fashion. As an appendix the writer gives a ' List of Species of Birds which have become extinct within the last 500 years, or are in danger of disappearance,' and the list is appallingly long.

The Life of the Common Gull told in Photographs, by **C. Rubow.** London : Witherby & Co. 1/6 net.

In this pamphlet are reproductions of 25 charming photographs illustrating various phases in the life of the Common Gull, and there are also six pages of letterpress, translated from the Dutch. The illustrations will equally appeal to the photographer and the ornithologist.

What will the Weather Be ? by **H. G. Bush.** Cambridge : W. Heffer & Sons. 6d. net.

This is a simply worded and carefully written pamphlet, which has already been referred to in these pages. The present, the second edition, has been entirely re-written, and some illustrations have been added. It is a useful little handbook.

Introduction to the Study of Rocks, and Guide to the Rock Collections in Kilvingrove Museum, by **Peter Macnair.** Glasgow. 80 pp., 3d.

This pamphlet is well written, and quite apart from the fact that it is a Museum Guide, it will be found to be a useful introduction to the study of rocks. It is written in clear language, and is well illustrated by photographs and diagrams.

We have received a **List of Herbaceous and Alpine Plants in Roundhay Park, Leeds,** compiled by **Mr. A. J. Allsop,** and sold at one penny.

It is a very useful compilation and will doubtless be gladly purchased by visitors to Roundhay Park. Readers can also find out where to buy manure and dried blood, virgin cork, homely cups of tea, sham blinds, drugs, hair felt, harness, sanitary appliances, and boots! There are also blank spaces for notes.

With commendable punctuality, Part 9. of **Major Barrett-Hamilton's History of British Mammals** (Gurney & Jackson, price 2/6 net) has made its appearance. It deals with the Lesser Shrew, the Water Shrew, Hares and Rabbits, and the extinct Pika or Mouse-hare. There are some excellent illustrations of the heads and skulls of the shrews, etc., and a fine coloured plate of Stoats. So far as we have been able to test them, the particulars as to distribution, etc., are remarkably full and accurate, and it is apparent that the author has consulted almost every item of literature relating to the subject, no matter how brief the note may have been.

From Messrs. Hutchinson & Co. we have received some parts of their **Marvels of the Universe,** which is appearing in 24 fortnightly parts at 7d. net each. They are astonishingly well illustrated and varied in scope. Amongst the items dealt with are sunflames, self-luminant fishes, plants that feed on insects, tree-climbing crabs, bees, the octopus, Japanese fowls, coal, wonderful birds' nests, waterspouts, ant-lions, etc., etc. In addition to the numerous excellent reproductions from photographs, there are some beautiful coloured plates. The ' Marvels of the Universe ' will certainly do much to popularise Natural History.

A YEAR'S SCIENTIFIC WORK IN YORKSHIRE:
BEING
THE YORKSHIRE NATURALISTS' UNION'S
FIFTIETH ANNUAL REPORT, FOR 1911.

Presented at Heckmondwike, Dec. 16th, 1911.

The Forty-ninth Annual Meeting was held at Middlesbrough on December 17th, 1910, under the Presidency of Prof. A. C. Seward, F.R.S. A report of this successful meeting appeared in "The Naturalist" for January, and our journal also has contained Prof. Seward's Presidential Address on "The Jurassic Flora of Yorkshire."

Seven **Field Meetings** have also been held, viz., to Harewood (Yorks., Mid. W.) on May 13th; Castleton (Yorks., N.E.), Whit week-end, June 3rd-5th; Barton-on-Humber (N. Lincs.) with the Lincolnshire Naturalists' Union, July 1st; Ingleton (Yorks., N.W), August Bank Holiday week-end, August 5th-7th; Huddersfield, for Harden Moss (Yorks., S.W.) September 9th; the Fungus Foray was held at Mulgrave Woods, September 23rd-28th; and the Marine Biology Committee met at Scarborough, September 22nd-26th. Detailed reports of all these excursions appeared in "The Naturalist" immediately after they were held.

The **Annual Meeting for 1912** will be held at Hull, on Dec. 14th, on the invitation of the Hull Scientific Club and Hull Geological Society.

Excursions for 1912.—

Yorks., S.E.—Riccall Common, May 4th.
,, N.E.—Filey and Bridlington, Whit week-end.
,, Mid. W.—Tanfield for Hack Fall, June 15th.
,, S.W.—Askern for Shirley Pool, July 11th (Thursday).
,, N.W.—Low Gill, August Bank Holiday.
Fungus Foray, Sandsend for Mulgrave, September 21st-26th.

The Affiliated Societies.—There are now forty affiliated societies. The South West Yorkshire Entomological Society and the Brighouse Naturalists' Society joined during the year, and the Barnoldswick and Earby Scientific Society and the Doncaster Grammar School Society have ceased to exist.

The **Statistics** furnished by the affiliated societies shew that their total membership is now 3301 (an average of 83 per society). This, added to the membership of the Union, makes our total numerical strength 3741.

The membership of the Union (without counting the affiliated societies, each of which is virtually a member), is now 440. The following new members and societies have joined during the year* :—

* This includes the Members elected at Heckmondwike.

Mr. T. E. Amyot, Bradford.
Mr. Joseph Anderton, Bradford.
Mr. Fred Allison, Guisborough.
Mr. H. R. H. Broomhead, Beverley
Mr. W. Bagshaw, Birkenshaw, nr. Bradford.
Mr. J. Meikle Brown, B.Sc., F.L.S., Sheffield.
Mr. Alfred Burgess, B.Sc., Sheffield.
Miss Charlotte A. Cooper, Robin Hood's Bay.
Mr. Wm. Cash, F.G.S., Halifax (Hon. Life Member).
Miss Josephine E. Crawshaw, Ilkley.
Mr. Thos. Elliott, Heckmondwike.
Mr. A. A. Fordham, Nunthorpe.
Major Gerald Barrett-Hamilton, J.P., etc., Waterford, Ireland.
Mr. H. E. Johnson, Bradford.
Rev. G. J. Lane, F.G.S., Saltburn.
Mr. A. Alex. Matthews, Ilkley.
Miss C. B. Mitchell, Leeds.
Mr. A. Moore, Cleckheaton.
Prof. J. H. Priestley, Leeds.
Mr. G. E. Priestman, Ilkley.
Mr. A. Pickles, Keighley.
Mr. T. B. Roe, Scarborough.
Mr. J. Rowntree, J.P., Scarborough.
Mr. T. B. Roe, Scarborough.
Rev. H. H. Shaw, M.A., York.
Mr. Henry Sisson, Sedbergh.
Mr. Wm. Sargeant, Barrow-in-Furness.
Mr. Walter Stiles, B.A., Leeds.
Mr. J. E. Stead, F.R.S., Redcar.
Mr. J. R. Stubley, Batley.
Mr. H. Hamshaw Thomas, Cambridge.
Mr. E. W. Taylor, York.
Mr. G. Waddington, Leeds.
Mr. G. C. Ward, Baildon.
Brighouse Naturalists' Society.
South-west Yorkshire Entomological Society.

Obituary.—We regret to record the death of Rev. E. Maule Cole, Wetwang; J. R. Mortimer, Driffield; John Carlton, Hull; Lord Airedale, Leeds; Sir John Brigg, Keighley; and J. Ibbotson, Sheffield.

References to the deaths of Mr. Mortimer and Mr. Cole were made in "The Naturalist" at the time.

Divisional Secretaries and Local Treasurers.—These have been again most useful in arranging the excursions, looking after subscriptions, etc., and have been re-elected.

General Committee.—The following have been added to the permanent general Committee:—

Jasper Atkinson, 33 St. Michael's Road, Headingley.
Prof. Patten, The University, Sheffield.
Oxley Grabham, M.A., The Museum, York.
W. Falconer, Slaithwaite.
Prof. Garstang, The University, Leeds.
R. H. Philip, 447 Beverley Road, Hull.

Transactions.—The question of the Union's Transactions is where it was last year, excepting that part of the Geological Bibliography appeared in "The Naturalist" for July last.

SECTIONS AND COMMITTEES.

VERTEBRATE SECTION.

West Riding.—Mr. R. Fortune writes:—Summer migrants generally were later than usual in arriving, some of them, as for instance Swifts and Spotted Flycatchers, especially so. Swifts were almost as late as last year, which was exceptional. Chiffchaffs and Willow Wrens were much less plentiful than usual, yet Wood Wrens appear to have been in their normal numbers. It looks almost as if some disaster had overtaken the two first-named, which the last, being later in arrival, had escaped

Land Rails have been more abundant than for many years past, but until there is a radical change in their nesting habits, I am afraid their numbers will not increase to any extent.

Whinchats and Redstarts continue to decrease in numbers, although Mr. Parkin appears to think that in his district this is not the case with regard to Whinchats. This state of things must be exceptional, as correspondents in various parts of the county are unanimous that there is a very great decrease in the numbers of these birds.

Despite their late arrival, summer birds departed somewhat earlier. This early departure is often noticeable in exceptionally fine summers, the reason being, no doubt, as Mr. Booth has pointed out, that food being plentiful, birds mature more rapidly, and are consequently ready for their flight southwards somewhat earlier than usual.

Winter migrants arrived in the West Riding a few days earlier than their average time, Redwings being first noticed on October 8th, and Fieldfares and Hooded Crows on October 14th.

The fine summer is no doubt responsible for a very good crop of Grouse. They have been very abundant. Pheasants, both wild and hand-reared, have also done exceptionally well, but Partridges have only been an average crop. In some districts they have done very well, and in others very badly. Hungarian Partridges have been imported into the county in large numbers of late years, in order to supplement the rapidly diminishing stock of native birds.

The more important records during the year were duly notified in "The Naturalist."

North Riding.—Mr. T. H. Nelson writes:—On Whit Monday, a Honey Buzzard, which had evidently died on migration, was found washed up on the shore between Redcar and Marske. The usual autumn flights of waders, Curlew, Godwits, Knots and small shore-birds, appeared at the estuary, but did not produce much of value, excepting a Ruff and a Black-tailed Godwit.

On Saturday, 30th September, there occurred one of those interesting irruptions of Skuas which have been noticed at intervals. A gale from the north-east suddenly sprang up about 6 o'clock, continuing to blow strongly all the morning and accompanied by heavy squalls of rain. Between 9 a.m. and 1 p.m., numbers of Skuas, both Richardson's and Pomatorhine, estimated at about 200, in parties of from five to twelve, were observed flying north-westward, low down, along the shore, and crossing over the breakwater into the Teesmouth. In the afternoon the wind veered to N.W., and, although the Skuas continued to pass, the migration was less pronounced than in the morning, and the birds kept out beyond the breakers. Those that were identified were all mature individuals. On Sunday, 1st October, the gale moderated, and only some half dozen Skuas were noticed flying well out to sea. During the storm on Saturday, two immature Sabine's Gulls were seen sitting on the shore, and in the afternoon a Grey Phalarope and another Sabine's Gull were reported.

An immature example of Buffon's Skua, much decomposed, which had been found on the Whitby coast on 4th October, was forwarded to me for identification.

For other detailed records see the pages of "The Naturalist."

East Riding.—Mr. E. W. Wade writes:—The special feature of the season has been the cold, wet, and backward Spring, followed in May by a sudden change to tropical warmth and sunshine, lasting till the end of the Summer, with but one break of wet during the last week in June. To find a parallel we must go back to 1883, when practically no rain fell in the East Riding of Yorkshire from April to December.

The result has been that our early breeding birds have been later than usual; the Rooks, in many cases, having had their eggs destroyed by frost, and Peewits being driven off the first nests by snowstorms.

Migrants arrived late, but when they came commenced the duties of nest-building and incubation immediately, *e.g.*, the Common Whitethroat, which arrived on 6th May, had, in one case, nearly finished building on 13th May. The Willow Wren, whose average date of arrival was 17th April, in one case had six eggs on 23rd April.

The breeding season for the smaller birds was a short one, and the return journey to winter quarters commenced sooner than usual, the warmth producing conditions parallel to those found in the Arctic regions, a most unusual state of things here.

Swallows and Martins did not commence laying till June, but two or three broods were reared during the season.

Game birds have done well, and Partridges have at last taken a turn for the better, rearing unusually large coveys; but in Holderness generally the bird is still scarce.

Hornsea Mere and Spurn are dealt with in the Protection Committee's report, and I have only one fact to note in reference to the former, viz., that the Great Crested Grebe, in spite of the protection afforded to it, does not increase, only three pairs of birds breeding, as in 1910.

Bempton.—The birds commenced to lay at the usual average date, and climbing went on uninterruptedly, first, second, and third scale being all gathered by the climbers. The Peregrine Falcon again nested in the usual eyrie, two young being hatched, one of which died in the nest, and the other was successfully reared.

On 3rd October a Little Owl was shot at Leconfield, and another on 5th October, male and female; the latter evidently having performed the duties of incubation. There is thus reason to suppose that the bird has possibly extended its breeding range into the East Riding of Yorkshire.

Two Black Guillemots were shot at Filey during the second week in November.

Mr. J. F. Musham reports that a Leach's Petrel was picked up in a dying condition near Hemingbrough Church, on Saturday, 18th November.

Wild Birds' and Eggs' Protection Committee's Report, 1911.—Mr. R. Fortune writes:—The amount received in subscriptions for 1911 is £24 2s. 6d., which, together with the balance in hand, made a total fund of £67 10s. 4d. The expenditure amounts to £39 1s. 0d., leaving a balance in hand of £28 9s. 4d.

The subscriptions received do not cover our expenses, but no special efforts have been made to obtain subscriptions this year. Our thanks are especially due to the Right Hon. Charles G. Milnes Gaskell and Mr. W. H. St. Quintin, for their generous support.

The outstanding feature of our work during the year has been (after several attempts) to induce the County Council of the North Riding to adopt our recommendation for a comprehensive protection order for that Riding.

Our suggestions and recommendations to the County Council for the East Riding for additions to their protection order were adopted.

The time limit for the entire protection of the birds in the sanctuaries of Spurn and Hornsea having expired, we recommended their extension for a further period, and are pleased to report that the protection was extended as suggested.

Through the efforts of this Committee, Yorkshire now possesses thoroughly efficient orders in each Riding.

The experiment of establishing Bearded Tits at Hornsea has every prospect of being successful, as at least one pair of birds have nested and reared their young.

We have again to thank our President for his generosity and services in this matter. He undertook the whole cost and also the superintendence of liberating the birds.

Our action brought upon the President a most ridiculous tirade from the Editors of "British Birds." The Committee can, however, well afford to ignore any remarks appearing in that obituary record of rare British birds. The fact of their comparing the introduction of Little Owls into this country with that of Bearded Tits, is, in itself, sufficient evidence that their remarks are unworthy of serious attention. *

The birds at Spurn and Hornsea have done well, and the nesting season has been a good one. At Spurn a party of Redshanks have nested for the first time. What is no doubt an offshoot of our colony of Lesser Terns, nested to the number of fifteen pairs at a more northern locality.

The Peregrines at Bempton were well looked after.

Stone Curlews have nested safely in the localities we have under special protection. At the beginning of the year, letters were sent to the owners of other estates where these birds nest, and in every case we were promised that the utmost would be done to give the birds efficient protection.

We have had the co-operation of the police in several cases where the protection orders had been infringed, and convictions have been obtained in many cases, for capturing Goldfinches, etc.

Receipts for 1911.	£	s.	d.
Right Hon. Charles G. Milnes Gaskell	10	0	0
W. H. St. Quintin, Esq.	5	0	0
W. J. Beaumont, Esq.	1	1	0
Dr. R. S. Bishop	1	0	0
H. B. Booth, Esq.	1	1	0
Oxley Grabham, Esq.	1	1	0
Digby Legard, Esq.	1	1	0
Claude Leatham, Esq.	1	1	0
W. Denison Roebuck, Esq.	1	1	0
E. W. Wade, Esq.	0	10	6
Johnson Wilkinson, Esq.	0	10	6
York Field Naturalists' Society	0	10	6
Sidney H. Smith, Esq.	0	5	0
	£24	2	6
Balance in hand from 1910	43	7	10
	£67	10	4

* See the Naturalist, October, pp. 348-350.

PAYMENTS FOR 1911.

	£	s.	d.
Wages, Spurn	14	0	0
,, Hornsea	14	0	0
Donation (Spurn)	1	1	0
,, (Bempton)	1	0	0
,, (*re* Stone Curlews) 1..	1	0	0
,, do. 2..	1	0	0
Dawson & Loncaster's account	2	2	0
Mr. Norman Lee's account	1	9	0
Mr. Fattorini's account for Badges for Watchers ..	0	19	0
Mr. Ackrill's account posters for Spurn and Hornsea	0	9	6
Protection Schedule Forms	0	2	0
Secretaries' Expenses, Postages, etc.	0	7	6
Subscriptions entered in error for 1910..	1	1	0
Rent of Room	0	10	0
	£39	1	0
Balance in hand	28	9	4
	£67	10	4

Yorkshire Mammals, Reptiles, and Fishes Investigation Committee.—The Committee have to report that the outstanding feature of the year's work has been the addition of a reptile to the Yorkshire list; Mr. W. J. Clarke having detected a local example of the Logger-headed Turtle in the Scarborough Museum.

The abnormal character of the season has had a two-fold effect. Owing to the drought, salmon and sea-trout have to a large extent been unable to get up the streams, and from the same cause there has been a marked increase in numbers of Field Voles, and other small mammals. Mr. Riley Fortune has furnished customary account of unusually large examples of Freshwater Fishes taken, and Mr. H. B. Booth draws attention to the partial character of the destruction caused to fish in the Wharfe by escape of ammoniacal liquor in October, Trout suffering enormously, and numerous other species not at all. Various records of the more uncommon species have been sent in.

ENTOMOLOGICAL SECTION.

Lepidoptera.—Messrs. Whitaker and Morley write:—In spite of the long hot summer, reports of the scarcity of insects have been received from all parts of the county. "Sugar" has been an almost continual failure, and other modes of collecting have been equally unsuccessful. A few usually common species, especially amongst the butterflies, have appeared in excessive numbers. The three Pierids have swarmed, and *P. napi* has appeared in three broods in the West Riding.

Mr. J. Porter records what he regards as an immigration of *P. brassicæ* at Hull. About the end of July these insects appeared in thousands, but fortunately very few larvæ resulted.

Mr. Morley records three specimens of *X. aurago* from Skelmanthorpe, and melanic *H. defoliaria* and *aurantiaria* (taken by himself), and black *A. menyanthidis* (taken by Mr. H. Dyson), are reported from the same district.

A. atropos has occurred in the larval state at Barnsley (Whitaker), and imagines have been captured at Shepley (Stephenson), and Middlestown, a fine melanic specimen (Hooper). Mr. H. Lodge records the capture of a fine specimen of *Deilephila livornica* at Normanton. Mr. J. F. Musham comments on the unusual abundance of *P. rapæ*, *C. phleas*, *V. urticæ*, and *E. hyperanthus*, in the Selby district.

Neuroptera and Trichoptera.—Mr. G. T. Porritt writes:—From a Neuropterist's point of view, the most interesting county event was the finding of the fine and local dragon-fly *Libellula fulva* by Mr. Corbett at Shirley Pool, near Askern, at the beginning of June. Some ten days later Mr. Corbett kindly took me to the place, when the species was still out in abundance, and the sight of so many on the wing, together with the natural beauty of the spot, was a delight long to be remembered.

With it were *Libellula quadrimaculata* and *Brachytron pratense* (a good species), less commonly, but yet in fair numbers; and of the smaller members of the order *Pyrrhosoma nymphula*, *Ischnura elegans*, and *Agrion puella*.

Other noteworthy Neuroptera and Trichoptera during the year were *Nemoura præcox*, which I again found in Harden Clough, Huddersfield, on April 15th; and in the same locality *Hemerobius atrifrons*, *H. orotypus*, and *Rhyacophila obliterata*, the first mentioned being new to the Huddersfield district, occurred on the Union's excursion there on September 9th.

At the Union's excursion at Ingleton, on August 7th, I was glad to find *Neureclipsis bimaculata*, thus making a second Yorkshire locality; and there also *Hemerobius orotypus* occurred. Lastly, among some Trichoptera taken by the Rev. Cyril D. Ash, at Saxton, near Tadcaster, were three specimens of *Limnophilus politus*, making a second county locality for that insect also.

Coleoptera Committee.—Mr. H. H. Corbett writes:—The season, from a collector's point of view, was very bad; beetles being few in both species and numbers. Notwithstanding, many interesting additions to the county list have been made, of which the following is a list.:—*Bembidium bipunctatum* L., *Hydroporus longulus* Muls., *Helophorus arvernicus* Muls., *Hydrochus angustatus* Germ., *Stenus nitens* Steph., *Acrulia inflata* Gyll., *Silpha dispar* Herbst., *Læmophlæus pusillus* Sch., *Psammæchus bipunctatus* F., *Monotoma spinicollis* Aubé., *Ennearthron cornutum* Gyll., *Clytus arcuatus* L., *Saperda carcharias* L., *Bruchus sp.*? This last insect is still unnamed, and possibly may be new to science.

Yorkshire Hymenoptera, Diptera, and Hemiptera Committee.—Considerable numbers of specimens of Hymenoptera have been sent to the Referees, with the result that about ten sawflies, thirteen Ichneumonidæ, and one species of the Oxyura group, twenty-four in all, have been added to the Yorkshire list.

Notes on the season's collecting have been sent in by Mr. H. H. Corbett for Doncaster, Mr. Rosse Butterfield for Keighley, and Mr. John F. Musham for Selby, while Mr. Alfred Hodgson has done some collecting in and round Leeds. It appears from their observations that the fine dry summer of 1911 has not been so favourable for Hymenoptera as might have been expected; the ground having been too hard-baked for the burrowing species. The social species, wasps in particular, have been abundant. The Diptera sent for identification have not yet been returned by the Referee, nor have any observations been submitted by members, except by Mr. Musham. Only one species of Hemiptera has been submitted, *Picromerus bidens* from Skelmanthorpe.

CONCHOLOGICAL SECTION.

Mr. Musham writes:—The extraordinary drought of the last summer must be held responsible for the meagre report, all but the common species having been conspicuous by their absence.

But note must be made of the occurrence at Bridlington of some lovely varieties of *Helix nemoralis*, collected by Master Stainforth, including that evanescent form var. *violacea labiata* (Taylor); and a colony of *Hyalinia lucida* (Drap.) in a back-garden at Selby.

Mr. A. J. Moore reports adding a few fresh localities for the East Riding for some of the scarcer forms.

Marine Biology.—At the annual meeting of the Committee at Scarborough, the Scarborough Field Naturalists were able to add many new finds to their list of records. The whole of the finds in all branches have been printed in "The Naturalist" for December with the exception of six sea-worms, which will be added in the January number. The names were sent after the list was in print. This list will be useful as forming the basis for future records.

We are pleased to notice that the recent revival in marine biological work has resulted in the local museums paying more attention to this branch of natural history.

BOTANICAL SECTION.

Mr. J. Fraser Robinson writes:—Perusal of the monthly parts of the present year's "Naturalist" will be quite sufficient to show that there is no decrease of interest in botanical science. On the contrary there is an almost unexpected revival, especially in the so-called "floristic" phase, for which we believe the Yorkshire Naturalists' Union is certainly to some extent happily

responsible. At none of the appointed excursions has the subject been neglected, and good results have rewarded investigators; whilst many of the affiliated societies can show a good year's work. We note that the veteran, Mr. J. G. Baker, is still adding new species and new stations to his North Yorkshire Flora; whilst in the East Riding a new station for an almost or entirely extinct plant, *Schœnus nigricans,* has been discovered at Kellythorpe, near Driffield, where it grows plentifully, with abundance of *Carex paniculata* and *Lastræa thelypteris.* Dr. Lee's recent supplemental list for the West Riding is further evidence of our initial statement.

Botanical Survey Committee.—Interesting observations on vegetation problems have been made by members of the committee during the year, and on the excursions increasing interest is being taken in this line of work. It is hoped in the near future means may be found to publish the results obtained, and also to establish Yorkshire Survey work on a still more definite basis.

Bryological Committee.—Mr. W. Ingham reports:—Mr. J. J. Marshall has added *Tortula vahliana, Bryum warneum,* and *Bryum torquescens* to the Lincolnshire Flora.

W. Ingham found *Tetraplodon mnioides, Polytrichum commune* var. *perigoniale,* and *Hypnum fluitans* var. *Jeanbernati* at the Castleton meeting of the Yorkshire Naturalists' Union; also *Swartzia montana* var. *compacta* on Ingleboro' at the Yorkshire Naturalists' Union meeting; the only other Yorkshire record for this distinct variety being by the Clough River at Sedbergh, also by W. Ingham.

Mr. C. A. Cheetham adds that he obtained *Zygodon lapponicus* B. and S., and *Th. philibertii* as additions to the Yorkshire Flora, from Ingleton; and from the same locality, *Grimmia torquata,* previously found in the county, at White Force, Teesdale, only.

Mycological Committee.—Mr. C. Crossland writes:—The fourth series of additions to the known Yorkshire fungi since 1905 was published in the April issue of "The Naturalist."

The Rev. Canon W. Fowler, Mr. Cheesman, and the writer represented the Committee at the Yorkshire and Lincolnshire joint excursion to Barton-on-Humber ("Naturalist," August, pp. 294-5); Messrs. M. Malone and J. W. H. Johnson at the Ingleton Excursion, where ten additions were made to the North-West Division ("Naturalist," September, p. 326); Messrs. C. H Broadhead, W. E. L. Wattam, and Mrs. Whiteley, reported on the fungi seen at the Huddersfield Excursion ("Naturalist," October, p. 366).

An unofficial foray was held at Sandsend for Mulgrave in May, the results of which are added to the Annual Foray in the same district in September ("Naturalist," November, pp. 337-393). It will be seen that of the 488 species collected, 138 are additions to the Sandsend and Mulgrave districts, of these 45 are new

to Yorkshire, including three new to the British Flora (and another to add later), and two new to Science. A full diagnosis of the two new species, and short description of those new to Britain will be published in "The Naturalist" in due course. The Committee recommend to the Union another foray, at the very least, in the same district, September 21st to 26th.

Messrs. W. D. Roebuck, Leeds; W. N. Cheesman, Selby; James Needham, Hebden Bridge; Thos. Hebden, Keighley; A. E. Peck and T. B. Roe, Scarbro', have sent many interesting species from their respective districts; Mr. Corbett, a remarkably fine specimen of *Polyporus varius*, and Mr. M. H. Stiles, Doncaster, a beautiful pinky-salmon coloured mould new to Britain.

A very able and opportune paper on "The Study of Fungi by Local Natural History Societies" was read by Mr. H. Wager, F.R.S., before the Committee of Delegates at the meeting of the British Association in Portsmouth. The work of the Mycological Committee of the Yorkshire Naturalists' Union was loyally held up as an example of what may be done by persistent investigation. 60 water-colour drawings by the writer, 60 stereo-photos by Mr. A. Clarke, and a number of photos by Mr. A. E. Peck, all of Yorkshire fungi, was sent, by request, to help to illustrate the address. The paper appeared in the October issue of "The Naturalist" (pp. 351-356).

GEOLOGICAL SECTION.

Geological Photographs Committee.—Mr. A. J. Stather writes:—This Committee has added the following photographs to its collection during the year:—

By Mr. J. T. Dyson—

Sections taken at the New Joint Dock, Hull.

No. 1.—Showing large trees taken from the peat bed.

No. 2.—Section showing position of Shell Bed.

No. 3 and 4.—Detail sections of Shell Bed.

By Mr. J. W. Stather—

No. 1.—Section in chalk at Flambro' Head, showing chalk crumpled by ice pressure.

No. 2.—Boulder on beach, Silex Bay, Flambro'. Shap boulder in foreground, Mountain Limestone boulder in the background.

No. 3.—Large block of Estuarine Sandstone, having fallen about 50 feet on to the floor of Stoup Brow Quarry (alum shales), Robin Hood's Bay.

Glacial Committee.—Mr. J. W. Stather writes:—The members of the Hull Geological Society Boulder Committee have done a fair amount of field work during the past year.

Filey.—On the beach at Filey, a few yards north of Hunmanby Gap, a boulder of Bunter sandstone, 30 yards long, was noted, embedded in the glacial clays which form the beach in

this locality. Mr. R. M. Robson reports a boulder of garnetiferous schist, between one and two tons in weight, at an elevation of 142 feet, three-quarters of a mile west of Filey.

Holderness.—In June, Dr. V. Milthers, of the Danish Geological Survey, visited this country, and spent several days on the East coast of Yorkshire examining the boulders. He was much impressed by the great display of Scandinavian boulders chiefly from the Christiania district, in South Holderness. One result of his visit will probably be the identification of some further Scandinavian rocks in East Yorkshire.

South Ferriby, Lincs.—Mr. T. Sheppard, F.G.S., records an exposure of the clays beneath the Red Chalk on the South Humber shore at South Ferriby. In these are embedded a number of large cake-shaped nodules, all of which are glacially striated on their upper surfaces, the striæ being from east to west, parallel with the old course of the Humber estuary. Close by, an exposure in the solid lower chalk has recently occurred as a result of the covering deposits having been removed by the changes in the course of the Humber waters. This exposure reveals the preglacial bed of the Humber estuary, and it is interesting to observe that this also is striated in the same direction as the striæ on the cement-nodules already referred to.

Thornholme, E. Yorks.—Reported by Mr. W. H. St. Quintin. Cheese-shaped Boulder of Augite syenite, nine inches in diameter, found on the drift gravel slope which runs back from the Bridlington road, just east of Thornholme Village, at 120 feet above O.D.

Coast Erosion.—Mr. J. J. Burton writes:—The amount of erosion of the Lias cliffs on the Cleveland Coast has been inconsiderable during the past year. Falls of small portions of cliff have occurred, but the heaped-up hard rock debris at the base has acted generally as a breakwater against the inrush of stormy sea waves.

Fossil Flora and Fauna of the Carboniferous Rocks Committee. Mr. H. Culpin writes:—Further sinkings in the neighbourhood of Doncaster have given favourable opportunities during the year for the study of the coal measures above the Barnsley seam. The results, which it is hoped will soon be available for publication, markedly confirm the utility of the marine bands, and the *Anthracomya phillipsi* beds, as guides to position in the rocks gone through.

Jurassic Flora Committee.—Mr. J. J. Burton writes:—The members of this committee live, in many cases, so far apart that meetings have not been convenient; but individual members have been actively investigating newly found plant-beds as well as the more well-known beds. In consultation with Professor Seward, a definite line of procedure was adopted, viz.:—

(1) Careful record of localities examined with lists of specimens and exact position of plant-beds.
(2) Investigation of new localities, especially inland.
(3) Detailed study of certain species in association with others.
(4) Search for specimens shewing structure.

Professor Seward and Mr. Thomas have kindly undertaken to describe and determine specimens.

The work done has been more or less preliminary up to the present, but several promising inland beds hitherto unknown or unworked have been discovered, and are being investigated.

OTHER COMMITTEES.

Yorkshire Arachnida Committee.—Mr. Falconer writes:—The exceptional weather in the past year has not been without its effect on spider life. In some districts, where the situation and geological formation tended to conditions of excessive dryness, individuals have been less plentiful than usual; but in others, where, in spite of the long drought, some degree of moisture was retained, the reverse has been the case.

Not only has the distributional range of many rare species been extended during the year, but 13 species new to the county have also been discovered, viz., in the N. Riding, 5, *Entelecara thorellii* Westr., *Hypselistes jacksonii* Camb., *Troxochrus ignobilis* Camb., *Xysticus sabulosus* Hahn, *Ero cambridgii* Kulcz; in the E. Riding, 3, *Theridion impressum* L. Koch, *Bathyphantes setiger* F. O. P., Camb., *Pirata latitans* Bl.; and in the W. Riding, 5, *Diplocephalus protuberans* Camb. (♀ new to Britain), *D. castaneipes* Sim., *Araeoncus crassiceps* Westr., *Epeira sturmii* Hahm, and *Pisaura mirabilis* Clerck. For particulars of these, with one exception, reference should be made to "New and Rare Yorkshire Spiders" ("Naturalist," August 1911, pp. 283-8). The *Hypselistes* nov. sp. there noted, appears from information since received, to have been an error, and must therefore be deleted, so that the total for the county is 309.

Further details of the Committee's work will appear elsewhere in 'The Naturalist.'

Committee of Suggestions for Research.—It is gratifying to record that suggestions for special observations made by the Committee are bearing fruit, and much attention has been paid to definite distribution problems during the Union's Excursions.

Appeals for advice for definite lines of work by local societies have been received, and the suggestions given are being carried out.

The Yorkshire Micro-Zoology and Micro-Botany Committee.—The interest in the work of this Committee is kept up by a few of its members, individually. Some of the work was recorded in "The Naturalist"; more will shortly appear. Young recruits are desired.

Soppitt Memorial Library.—A very valuable addition has been made to the library during the year in the shape of the MSS. of Massee and Crossland's "Fungus Flora of Yorkshire." These contain all the records on which the Flora is based; also thousands of detailed records of which only a general and summarised statement was published. The volumes will therefore be invaluable for reference, and for purposes of future local floras. For such a purpose the MSS. were given to Mr. W. Denison Roebuck, and finding them so valuable in this respect, he and Mr. E. J. T. Ingle had them bound in six volumes. These are rendered still more valuable in that they have pasted the printed slip for each species to face the MS. on which it was founded. Our thanks are extended to Messrs. Massee and Crossland, and also to Messrs. Roebuck and Ingle, for the MSS., and their preservation in this convenient form.

Correction:—In the Soppitt Library report for last year delete the comma between the words "Farnley Tyas," and the last two lines should read thus:—varieties; "The Study of Fungi in Yorkshire"; "Plants of Pecket Wood"; and "An 18th Century Naturalist: (=James Bolton, Halifax)."

British Association.—Mr. Sheppard attended the meeting of the British Association, but on account of someone having blundered, no announcement was made of the first meeting of the Committee of Delegates from Corresponding Societies (which was held on the first day, the journals for which were "off"), and consequently it was badly attended. He left the meeting before the second Conference of Delegates, and consequently has nothing to report.

"The Naturalist" has been regularly published, and by having more lines to a page, it has been possible this year to include all the suitable articles and notes submitted without having additional pages.

Secretariate.—At the recent meeting of the Executive, the following letter was read:—"I beg to tender my resignation as Hon. Secretary. During the nine years I have held the office, the Union has continued its excellent work in the county, and besides the various meetings and excursions which have been held, steps have been taken to complete the numerous memoirs which had previously been in various stages of incompleteness. In this way Baker's "North Yorkshire," Massee and Crossland's "Fungus Flora," the second edition of Porritt's "Lepidoptera," and "The Birds of Yorkshire" have been completed and published. In addition, two parts of the Transactions (Miscellaneous Series) have been issued, containing the Annual Reports, Reports of Fungus Forays, Geological Bibliographies, and reprints of excursion programmes. The cost of the printing and publication of these monographs, etc., in the

ordinary way, would have more than accounted for the whole of the Union's income during that period, but by arrangement with the publishers, and by numerous subscriptions and private donations from the authors and their friends, the work has been possible.

The Union's funds have also been substantially assisted by the arrangement made for the sale of its books to the Hull Public Library, and by royalties of £40 in one case, and £30 in another, received from the publishers.

The nine volumes of "The Naturalist" issued during my term of office have also, I trust, given satisfaction, and they certainly have contained many more pages and plates than was previously possible.

Since 1903 the Union has published something like eight thousand pages of printed matter, every one of which has been edited by the Secretary, and a fair proportion has been written by him.

Of the present membership of the Union, no fewer than three hundred have been elected since 1903, a large proportion being nominated by myself.

In view of the preceding, I feel I have now done a fair share of the Union's work, and, without intending in any way to lose an interest in its aims and objects, I shall be glad if the executive would make arrangements for me to be relieved of the secretarial duties at the end of the year.

Yours faithfully,

T. SHEPPARD."

It is with great regret that the Executive felt themselves compelled to accept this resignation, and they recommended that he be elected an Honorary Life Member of the Union, as a slight recognition of the services he has rendered to the Union as Hon. Secretary for the past nine years. This recommendation was unanimously adopted.

The Presidency for 1912.—On the invitation of the Executive, the presidency for 1912 has been accepted by Mr. J. W. Taylor, of Leeds.

Affiliated Societies.—A list of these, with the secretaries, appeared in "The Naturalist" for January last.

Financial Statement.—

1912 Jan. 1.

INCOME AND EXPENDITURE STATEMENT, 12 months to November 30, 1911.

INCOME.

	£	s.	d.
Members' Annual Subscriptions ..	115	14	0
Levies from Associated Societies ..	14	10	1
Arrears received during year.. .. .. .. £46 6 7			
Less: Amount taken to Account in Balance Sheet 1910 .. .. 32 3 8			
	14	2	11
Special Appeal Fund (*contra*).. ..	2	4	6
Life Members' Subscriptions (*contra*)	7	1	6
Sales of Publications—			
Transactions 0 9 1			
Lees' Flora 0 10 6			
Porritt's Lepidoptera 0 5 0			
	1	4	7
Sundries	1	3	5
"Naturalist"—	£	s.	d.
Subscriptions ..	95	0	0
Sales	0	3	6
Recognition fee ..	5	0	0
	100	3	6
	£256	4	6

EXPENDITURE.

	£	s.	d.
Expenses of Meetings	9	7	2
Printing and Stationery (General A/c)	23	2	11
Postages, Telegrams, etc. (Hon. Secretary's Account)	18	11	4
Clerkage (Hon. Secretary's Account)	20	0	0
Rent, etc., of Room, Hull	6	17	6
Printing and Stationery (Hon. Treasurer's Account)	2	0	0
Postages (Hon. Treasurer's Account)	1	15	5
Special Appeal Fund: 1910 £9 8 0 (*Contra*) 1911 2 4 6	11	12	6
Life Members' Subscriptions (*contra*)	7	1	6
Cost of Publications:—			
Annual Report, 1910.. £15 3 0			
Less—Provision in A/cs for 1910 .. .. .. 13 0 0			
	2	3	0
Annual Report, 1911 (estimate).. .. .. .. 8 0 0			
	10	3	0
"Naturalist"			
Subscribers £95 2 6			
Life Members' Copies 6 10 0			
Exchanges.. .. .. 2 15 0			
Reprints 1 18 0			
Odd numbers 0 18 9			
Binding and sundries 2 5 1			
Postages 4 4 4			
	113	13	8
Balance, being excess of Income over Expenditure during 1911	31	19	6
	£256	4	6

BALANCE SHEET, November 30, 1911.

LIABILITIES.

	£	s.	d.	£	s	d.
Amounts due from Union—						
"Naturalist" ..	108	15	1			
Annual Report, 1910	15	3	0			
Sundries	22	16	5			
				146	14	6
Annual Report, 1911 (estimate) ..				8	0	0
Subscriptions received in advance				0	15	6
Life Members' Account				29	2	6
"Hey" Legacy Account				20	0	0
				£204	12	6

ASSETS.

	£	s.	d.	£	s.	d.
Cash at Bank	32	11	2			
Cash with Hon. Secretary	12	4	9			
				44	15	11
Subscriptions in Arrears	45	10	1			
Less: Amount written off as unrealisable ..	7	10	1			
				38	0	0
Balance being excess of Liabilities over Assets, Dec. 1st, 1910	165	8	7			
Less: Income in excess of Expenditure during 1911	31	19	6			
	133	9	1			
Less: Special Appeal Fund	11	12	6			
				121	16	7
				£204	12	6

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THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY
T. SHEPPARD, F.G.S., F.R.G.S., F.S.A.Scot.,
THE MUSEUMS, HULL;
AND
T. W. WOODHEAD, Ph.D., F.L.S.,
TECHNICAL COLLEGE, HUDDERSFIELD.

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
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MAR 7 1912

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VERTEBRATE SECTION.

(PRESIDENT :—OXLEY GRABHAM, Esq., M.A., M.B.O.U.).

Two Meetings will be held in Room C 8, at the Leeds Institute, Leeds, at 3-15 p.m. and 6-30 p.m. respectively, on Saturday, February 17th, 1912.

BUSINESS :—

The appointment of Bird Watchers for 1912, and discussion upon other matters in connection with the Yorkshire Wild Birds' and Eggs Protection Acts Committee.

Short papers (mostly illustrated by lantern slides or specimens) will be given as follows :—"Finds in the Lothersdale Cave," Mr. John Holmes; "Additional Notes on the Birds of Spain," Dr. E. S. Steward; "Notes on some Birds of the Scilly Islands," Mr. Jasper Atkinson; "The Gamekeeper's Traps," Mr. S. H. Smith."

Will Officials of Affiliated Societies kindly notify their Members.

A. HAIGH-LUMBY, *Hon. Sec.*,
121 Horton Grange Road, Bradford.

NOTES AND COMMENTS.

A PREHISTORIC ROUTE.

In the Proceedings of the Society of Antiquaries, 2nd Ser., Vol. XXIII., Part II., recently issued, Mr. E. Kitson Clark has an elaborate paper on 'A Prehistoric Route in Yorkshire.' He shews that in Denmark prehistoric roads are defined by the lines of pre-Roman tumuli; and he endeavours to shew, by the aid of coloured contour maps, etc., that similar methods may be adopted in Yorkshire. Though the paper is interesting, it is by no means convincing. In East Yorkshire it would be difficult to find a route where there were no British barrows.

MUSEUM FOR RIPON.

Miss Darnbrough, of The Mount, Ripon, has offered to hand over to the Ripon Corporation the old Thorpe Prebends House in St. Agnesgate for the purpose of a museum. The house was bequeathed by the late Mr. S. Darnbrough with the stipulation that it should be put into its original condition and given to the Corporation when the accumulated rents amounted to £600. At present only £150 has accumulated, but Miss Darnbrough offered £200 if the Corporation would give the remaining £250. The Mayor, who submitted the offer to the City Council, urged that it should be accepted, as the house would be a valuable asset to the antiquities of Ripon. The property is valued at £1000. Oddly enough, a long discussion followed. Successive amendments, first to decline the offer, and secondly to accept the house only as a show place of historic interest were defeated, the Mayor's resolution being adopted. Possibly the entomological, etc., collections, made by the late Lord Ripon, which we believe are stored at the Ripon Town Hall, pending the provision of a suitable building, will now be placed on exhibition.

THE SCOTTISH NATURALIST.

No. 1 of *The Scottish Naturalist*—a monthly magazine devoted to Zoology, dated January, 1912, takes the place of the well-known quarterly 'Annals of Scottish Natural History.' The editors are Messrs. W. Eagle Clarke, W. Evans and Percy H. Grimshaw. Botany is now excluded, and there are several notes not bearing upon Scotland at all—a feature we do not remember to have noticed in the 'Annals.' Mr. H. J. Elwes, F.R.S., writes some valuable notes on the Primitive Sheep in Scotland, and there are some new bird, etc., records. As some years ago 'The Scottish Naturalist' was published and ran into several volumes, we certainly think the present part should have been styled 'New Series, No. I.', in order to prevent confusion to future workers.

MICROSCOPIC STRUCTURE OF COAL.

In this paper,* read before the Manchester Geological and Mining Society, Mr. James Lomax gives some valuable observations on the structure of Coal, which is often regarded as practically structureless. If sections are carefully prepared, coal is seen to contain, not only numerous well-defined structures, but characters which the author considers to be peculiar to each seam. He finds that most coals consist of alternating bands of lamellæ of bright and dull coal, the dull laminæ are made up largely of megaspores in a ground mass of microspores; while the bright laminæ are composed of microspores, and the remains of highly compressed leaves and other tissues. He also describes and figures certain amber coloured bodies which he names provisionally *Amberites*, and other oval, apparently highly resinous bodies *Ovalites resinosus*. Several vesicular cavities were also found to occur commonly in coal, which, before being tapped, probably contained gas. The sections of coal described are from several seams at Atherton, Abram and Little Lever in Lancashire; Altofts and Barnsley in Yorkshire and the Sneyd Colliery in North Staffordshire. The paper was described by Mr. W. E. Garforth as the most valuable and instructive ever presented to the society. Certainly no cost has been spared in its publication. It is illustrated by thirty-two figures on twelve folding plates, fifteen of the figures being beautifully reproduced in colour.

NEW SPECIES.

In *The Entomologist's Record*, Vol. XXIII., No. 12, Mr. Oscar John has some useful suggestions to make in reference to the admirable principle that it is suggested should be adopted by the next Entomological Congress, viz., that 'no description should be valid without a good figure.' One is that 'Types should not be kept in private collections, but given over to museums, where they are less subject to the possibility of being lost or destroyed.' We need hardly say we cordially agree with this, though whether the average 'private collector' will, is another matter. He then makes very pertinent suggestions in regard to the steps to be taken to ensure that the so-called 'new species' have not previously been described, and as to the best method of illustrating them. With his concluding remarks we heartily concur. He says: 'All this, of course, would make it much more difficult to put out lots of new names; but I am sure, that if one or another species should remain

* 'The Microscopical Examination of Coal, and its use in determining the inflammable constituents present therein,' by James Lomax. pp. 21 and 12 plates. Transactions of the Institution of Mining Engineers, Vol. XLII., part 1.

undescribed for more or less time, no one but an ambitious author will be the loser, whereas entomology as a science will certainly be the gainer, relieved of so many confusing—and unnecessary—names of "new" lepidoptera. The more we complicate the laws for "valable" descriptions, and restrict the sport of namegiving, the more we shall simplify serious systematic work.'

A NEW (?) OX.

'In describing (*Archaeologia Æliana*, ser. 3, Vol. VII.), the animal remains obtained during the excavations on the site of the Roman city of Corstopitum, near Newcastle-on-Tyne, in 1910, Messrs. A. Meek and R. A. H. Gray state that the bones and skulls of many of the oxen agree very closely with those of the white cattle of Chillingham and other British parks. A peculiarity said to characterise both is the absence of early shedding of the antepenultimate lower premolar. On this ground both the Chillingham and the Roman cattle are declared to represent a new wild species, for which the name *Bos sylvestris* is proposed; but whether this is typified by the former or the latter the reader is left to decide for himself. They ignore the fact that park-cattle already possess a scientific name—*Urus scoticus* of Hamilton Smith—and likewise that the colour of these cattle is decisive as to their domesticated origin. Most naturalists would likewise regard the alleged absence of the anterior premolar as a feature due to domestication.'—(*Nature*, No. 2198).

Mr. W. H. Pearson records *Lophozia bantriensis* in South Lancashire (*Lancashire Naturalist*, No. 44).

The fiftieth report of the Yorkshire Naturalists' Union, reprinted from *The Naturalist*, can be obtained from the Editor, the Museum, Hull, price 6d. each.

Mr. F. A. Day records the rare beetle *Oxypoda soror*, which he found amongst the short grass at the summit of Saddleback, Cumberland.—(*The Entomologist's Monthly Magazine*, January 1912).

Part VII. of *The Micrologist* (Flatters, Melborne & McKecknie, Manchester, 1/6) contains papers on Anthozoa, Echinoderma, etc.; and 'Water Plants' by Abraham Flatters. They are illustrated by five excellent figures on a plate.

Dr. F. A. Bather has a paper on 'The Holotypes of the Fossil Scorpions *Palæomachus anglicus* and *Palæophonus caledonicus*,' in *The Annals and Magazine of Natural History* for November 1911. The former is from the Coal Measures near Mansfield.

The Journal of Conchology (Vol. XIII., No. 9) contains a paper by Mr. J. W. Taylor on 'Biology of the Mollusca, based chiefly upon a study of one of our commonest species, *Helix aspersa*'; and also a record of a dextral form of *Clausilia bidentata* from Skipton.

In *The Records of the Past* (Vol. X., Part VI.), Dr. George Grant MacCurdy has an illustrated article on 'Somatology and Man's Antiquity'; Dr. W. M. Flinders Petrie writes on Roman Portraits, and Mr. H. J. Cook gives illustrations of a human skull with an embedded flint arrow-head, from Vancouver.

YORKSHIRE NATURALISTS' UNION AT HECKMONDWIKE.

THE fiftieth annual congress of the Yorkshire Naturalists' Union was held at Heckmondwike on Saturday—the place where it had its birth just half a century ago. There were over 300 members and associates present, including delegates from 38 affiliated societies.

At the meeting of the general committees held in the afternoon, Mr. G. T. Porritt was in the chair. Mr. T. Sheppard, F.G.S., the hon. secretary, submitted the annual report, which showed that there were 3731 members and associates. The excursions for 1912 were arranged as follow :—Riccall Common, on May 4th ; Filey and Bridlington, Whit week-end ; Tanfield, on June 15th ; Askern, on July 11th ; Low Gill, on August Bank Holiday ; and Sandsend for Mulgrave (fungus foray), September 21st to 26th. The next annual meeting will be held at Hull, on Dec. 14th, 1912. The resignation of Mr. T. Sheppard as hon. secretary was accepted with regret, and in consideration of his many services during the past nine years he was elected an honorary life member of the union. Mr. W. Cash, F.G.S., the eminent palæobotanist, was similarly honoured.

The officers for 1912 were elected as follows :—President, Mr. J. W. Taylor, of Leeds ; treasurer, Mr. H. Culpin, of Doncaster ; secretaries, Messrs. T. W. Woodhead, Ph.D., and W. E. L. Wattam, Huddersfield ; editor, Mr. T. Sheppard.

For the List of new members of the Permanent General Committee, and other information, reference should be made to 'The Naturalist,' for January, pp. 17-32.

The members of the Heckmondwike and Spen Valley Naturalists' Societies had arranged an excellent exhibition of local natural history, etc., specimens, and also held a conversazione in honour of the visit of the union to its birthplace. Refreshments were provided.

In the morning Mr. John Niven kindly invited the members to visit his colliery at Mirfield.

In the evening there was a crowded audience in the new schools at Heckmondwike, when the members were welcomed by Councillor T. Elliott and Mr. H. T. Nottingham. In the regrettable absence through illness of the retiring president, Mr. Alfred Harker, M.A., F.R.S., of Cambridge, his address was read by Mr. E. Hawkesworth. He dealt with 'Petrology in Yorkshire,' and in a lucid and entertaining manner referred to the history of the microscopic study of the rocks of the county (see pp. 37-44).

Subsequently there was an exhibition of nature photographs by the aid of the cinematograph, through the good offices of Messrs. W. Bagshaw and W. Goodall. The Union's thanks are certainly due to the Heckmondwike and the Spen Valley Societies for their hearty help, and particularly to Messrs. A. Moore and G. W. Parker, who made all the local arrangements, and made them well.

PETROLOGY IN YORKSHIRE.*

ALFRED HARKER, M.A., F.R.S., F.G.S.,
Cambridge.

THE fiftieth Annual Meeting of the Yorkshire Naturalists' Union might be deemed a fit occasion for reviewing the work accomplished during its long career by the body to which we all own allegiance. The record is an honourable one, and much interest — perhaps some wholesome lessons too—might be gathered from an adequate survey of it. Such a task, however, could be profitably attempted only by one who has been closely in touch with the activities of the Union ; and the circumstances which have made me for long an exile from my native county have denied me this necessary qualification.

I relinquish the attempt not without some regret. It was in rambles about my Yorkshire home that I acquired early an interest in shells, in insects, in the minute life of our ponds and streams ; and my enthusiasm for geology was first kindled by John Phillips' writings, my guide on many an excursion along our coast. With these memories, I have always cherished a keen interest in the work of the Yorkshire Naturalists' Union ; but it has perforce been the interest of an onlooker rather than an actor, for, in thirty years of membership, I have seldom found opportunity to take part in the meetings. I must therefore crave your indulgence if I confine within somewhat narrow limits the remarks which I have to offer to this gathering. But, while a detailed retrospect lies outside my scope, I should certainly be lacking in a due regard for the occasion, were I to let it pass without giving some expression to the reflections prompted by this anniversary.

At the respectable age which the Union has now attained, it does not, to the most anxious eyes, show any signs of senile decay. Our muster-roll to-day numbers over forty affiliated societies. An institution which, on its fiftieth birthday, can point to so numerous a progeny, assuredly need not be ashamed to speak with its enemies in the gate. The field-meetings, which visit in turn every district of Yorkshire, show no flagging of interest, but abundantly demonstrate that, after half a century of such exploration, there is still an ample field for the energies of our naturalists. The Union largely supports, and, under the guidance of a succession of able editors, has continued to maintain at a high standard, the oldest scientific periodical in the country. The more weighty contributions published

* An Address delivered at the Fiftieth Annual Meeting of the Yorkshire Naturalists' Union, at Heckmondwike, December 16th, 1911.

through the medium of the Transactions have taken a deservedly high place among permanent records; and this important branch of the work could be considerably extended, were the list of members large enough to supply the requisite funds. Waiving this financial question, the past and present of the Union give, if we will, legitimate cause for complacency, or may afford us, in graver mood, strong ground of encouragement for the future.

It is peculiarly appropriate that we meet to-day in the town where the Union first saw the light, and at the invitation of the Heckmondwike Naturalists' Society, the only one which has held a place on our list throughout the whole period of fifty years. It is an added source of interest and gratification that we have among us to-day surviving representatives of the enthusiastic band of naturalists who originated the Union half a century ago. Out-door tastes and healthy intellectual interests are no bad ingredients in a recipe for longevity, and we may hope that some who take part in this gathering to-day will be here to tell the tale in 1961.

If we ask the reason of the success which has attended the career of the Yorkshire Naturalists' Union, the answer, I think, is not far to seek. It is merely fidelity to two or three simple principles which wisely guided our founders and those who, fifteen years later, reorganised the Union upon its present footing. In the first place, the design common to all such bodies, that of bringing together those having like interests and aims, has assumed in our case a special form. We are not merely a large society, but a federation of numerous independent societies. These, in combining for common ends, do not lose their individuality, and to loyal co-operation there is added the stimulus of a wholesome rivalry. Secondly, the Union has never failed to recognise that the natural province of the amateur naturalist in his own county or district. Here is the field nearest to his hand, and here, too, may his efforts most certainly win a return in the form of contributions of real value to the common stock of knowledge. The Yorkshire naturalist at least, with so wide and diversified a territory for his birthright, may well rest content with this sphere of action. Again, the Union, from the first, has taken its work seriously. In familiar phrase, it has always meant business, and the holiday element in the field excursions has been kept in due subordination. Lastly, there is the actual machinery of the work, in particular the division into various sections, each working within its own lines, sometimes working together on the border-lines, and constantly reminded that, despite this necessary partition of practical energies, Nature is still a whole, and the study of Nature is, in a real sense, not many sciences, but one. To these advantages—an elastic constitu-

Naturalist,

tion, a jealous localisation of operations, a becoming earnestness, and a good working organisation—we may, I think, attribute in great measure the continued vitality of the Union. None the less it behoves us to remember, with gratitude as regards the past and for admonition as regards the future, that the ultimate strength of any human institution resides not merely in the framework of the system, but in the energy and devotion of those to whom the trust is committed.

While each of us must accept his share of this responsibility, the burden rests, in practice, mainly upon the officers of the Union, and of the Sections, and, above all, upon the Secretary, who is indeed the main-spring of the whole machine. In the early times, to which we look back with interest to-day, there was, we are told, no President but only a Secretary, and the Union seems to have prospered admirably under his sole ministrations. As regards the actual management of affairs, the situation has not been materially different during the present year, for an absentee President, I am afraid, rather aggravates than lightens the burden of the really responsible officer. The Union has been fortunate in a succession of active and able secretaries, and Mr. Sheppard, from whom we reluctantly part to-day, has worthily upheld that tradition. He carries with him on his retirement the assurance that, in every branch of its work, the Union stands to-day the stronger for his nine years of devoted service.

Not the least flourishing of our sections is that devoted to geology, and it seems to have grown decidedly in popularity in recent years. In some respects it stands, I think, rather apart from the other sections. The entomologists or the botanists may always hope to bring home from a day's excursion some distinct contribution to the fauna or flora of the county; and such records, brought together in the annual reports, constitute very definite additions to the sum of knowledge. Field geology, on the other hand, if it is to result in discoveries of value, often involves detailed survey, protracted search, and repeated visits; nor is its success always promoted by a large number of participants. True, a lucky 'find' will sometimes remind us that twenty hammers may be better than one; but, on the whole, the *immediate* results of geological excursions are of the nature of instruction and preparation rather than research. The geologist has here the incentive of comradeship, the advantage of comparing views and discussing knotty points on the ground, the opportunity of collecting specimens for study at home. For actual *research* in this department we must look rather to individual contributions in the pages of 'The Naturalist' and elsewhere, often inspired by the excursions, and to the organised work of the committees. In confirmation of this view, I may point to

the fact that no fewer than five of our committees of research are appropriated to geology, while nine suffice for the needs of all the other sections together.

Taking now the comprehensive view thus indicated of the geological activities of the Union, we find that these cover a wide range of interests. Almost every branch of practical geology is embraced, though all branches have not received equal attention. That in which our record has least to show is undoubtedly Petrology; and this observation applies to Presidential Addresses no less than to more formal contributions. Not a few distinguished geologists, connected by birth or by their labours with Yorkshire, have filled the place which to-day I have the honour to occupy, but to find a petrologist in the Chair of the Union we must go back more than thirty years. In 1878-9 the President was Henry Clifton Sorby, of Sheffield, justly regarded as the father of the modern school of microscopical petrology; and I feel a peculiar pleasure in being thus even distantly associated with one to whom, though I never saw him in the flesh, I have always looked up as to a master.

There is, it would appear, a very prevalent belief, though one resting, I venture to think, on slight foundation, that petrology is a study for specialists; that it offers little opportunity to a man who is isolated from fellow-workers, and can bring to it perhaps only the scanty leisure of a professional or business life. It would be easy to show, on the contrary, that we owe to amateurs some of the most valuable pieces of research and some of the most fertile suggestions in this branch of geology. The disabilities glanced at may be more than outweighed by freedom from conventional and professional trammels, a fresher view-point, and, assuming a local subject to be chosen, the opportunity of exhaustive study, such as no alien can command. It is, I think, a mistake to assume that increasing specialisation in science has widened the difference between the professional and the amateur status. As new lines of research have multiplied, the points of contact between them have become more numerous. So, if the actual province of the specialist tends to become narrower, his collateral interests tend rather to widen; and, in the course even of his special work, he is frequently led on to ground where his footing is strictly that of an amateur. In this very real sense, as well as in the etymological sense, every votary of science must be an amateur, and it is on this common ground that I have the privilege of meeting my fellow-members of the Union.

Again, I have sometimes heard it urged that Yorkshire does not afford an advantageous field for the petrologist, in view of the poverty of igneous rocks within our borders. Such a complaint savours almost of disrespect to the memory of

Sorby; for we must remember, not only that modern petrology had its birth in Yorkshire, but also that it was in the beginning the petrology chiefly of sedimentary rocks. It is true that interest has since been diverted more especially to igneous rocks and crystalline schists; but this certainly does not imply that the earlier field of research is exhausted, nor that, in the problems which it still presents, it is inferior in interest to the more trodden paths. Indeed, its possibilities have been made sufficiently evident by other workers in recent years, although in his own country of Yorkshire the prophet is, I think, still without the honour which he would most have appreciated—that of imitation.

It should be remarked that in the study of sedimentary deposits, the petrologist of to-day has at command simple and easily applied methods of working, which were unknown to the pioneer in this line of research. This will be best illustrated by one or two examples. Some of Dr. Sorby's earliest investigations were concerned with sands and sandstones as throwing light on the physical geography and geology of former periods, especially as regards the direction from which the detritus was derived and the nature of the parent rock-masses which furnished it. He paid particular attention to peculiarities of bedding due to currents of different velocities in water of different depths, a subject on which the last word has not yet been said; but he also obtained interesting results from a minute examination of the sand-grains themselves. This latter line of study has been shown to be capable of considerable development. Significance attaches not so much to the grains of quartz and felspar, which make up the chief bulk of most deposits of this kind, as to the rarer constituents. These existed originally as minor accessory elements in the igneous and crystalline rocks from which the material has been directly or indirectly derived, and different groups of crystalline rocks have their own characteristic accessory minerals. Thus, a certain type of granite will yield fragments of tourmaline; many igneous rocks of more basic composition furnish abundant grains of magnetite and ilmenite; crystalline schists representing old metamorphosed sediments will give, in different cases, andalusite or cyanite or staurolite or garnet; and so for other types of rocks. These minerals are recognisable in small fragments, and afford a valuable clue in tracking the sediment to its source. They occur, however, in most cases only sparingly amidst a great preponderance of quartz-grains and other less significant constituents. From these the accessory minerals may be separated by taking advantage of the fact that they are all of comparatively high specific gravity. Most of the lighter minerals, such as quartz, can be washed away with water, the most convenient utensil

being the *batêa* or conical pan used by the Brazilian miners. After this, recourse may be had to one of the heavy solutions which have come into use in petrographical laboratories, such as those devised by Klein and Brauns.* These liquids can be prepared with high specific gravity, and diluted down as required. In this way the heavy minerals can be separated, not only from the light, but from one another. A further refinement, devised by Professor Sollas, is a column of heavy liquid with density graduated from top to bottom. In this the grains arrange themselves according to their several specific gravities, and a complete separation is effected in one operation. This method of mechanical analysis may be applied to loose sands or friable sandstones, and equally to those having a calcareous or ferruginous cement, which can be removed by solution in weak acid. By determining the percentages of the several constituents it can be made a quantitative analysis. It is scarcely necessary to remark that, in work of this kind, isolated observations have but little value: the study should be a comparative one. Thus, by samples from a particular formation taken in different localities, we can trace the change in its constitution as it is followed in a given direction. Such investigations as those of Mr. Thomas on the Trias of the West of England illustrate the results which may be obtained from such a comparative study. It may not unreasonably be expected that conclusions no less interesting would reward a like detailed examination of the Millstone Grit and Coal-Measures of the West Riding, the Trias of the Vale of York, or the Jurassic sandstones of our coast.

It is not only the accessory constituents of sands that afford a clue to the source of the material. Information may be obtained also from the nature of the minute inclusions in the quartz-grains, and from the shape and surface-characters of the grains themselves. Again, the average size of the grains, the admixture of grains of different sizes, the degree of rounding produced by attrition, these and other characters will often warrant interesting conclusions relative to the conditions of transportation and accumulation of the sediments. Even the humidity or aridity of the climate at past epochs may sometimes be inferred from the state of preservation of the felspar-grains in sandstones. All these are contributions to what is perhaps the most fascinating branch of geology, viz., palæogeography, the actual restoration of the physical conditions of our area at different remote epochs.

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* Klein's solution is cadmium boro-tungstate, dissolved in water; Braun's is methyl iodide, diluted as required with benzol.

Questions of the same kind, and to be approached in the same way, arise with reference to the transportation, distribution, and deposition of sediments under the conditions existing at the present time. The results of inquiry on these lines will not only be of interest in themselves, but may not improbably have important practical applications. Such a problem is the source of the 'mud' (which, however, is largely sand) of the Humber estuary. How much of this is brought down by the river from the drainage-basins of Trent and Ouse, and how much is carried up by the tide from the waste of the Holderness cliffs? This has an obvious bearing on questions of warping, of dredging, and of coast-protection. It is not too much to expect that light might be thrown on the matter by a comparative study of the sediments themselves from the petrographical side.

The true argillaceous sediments—clays, shales, marls, and the like—offer, I think, a less promising field for those workers to whom time, technical skill, and rather costly instruments are considerations of weight. It is true that the most important British contributions in this line have come from an amateur petrologist, Mr. Hutchings of Newcastle; but it is clear that the work presents difficulties not to be surmounted by all. The minute size of the elements in these fine-textured deposits demands the use of high magnifying powers and special modes of illumination, and chemical analysis is almost a necessary concomitant of the microscopical work.

Nevertheless, apart from research of this order, there is room for simple and easy observations on argillaceous rocks, which, carried out systematically, have their value. The minute elements of a clay are not all of the same grade of magnitude, and a partial separation may be effected among them according to the time required for settlement in water. By this fractionating process we obtain a rough mechanical analysis, which is not without significance for purposes of comparison. Most easily isolated is the sandy element which is seldom wanting in ordinary argillaceous deposits; and in clays, no less than in sands, we may find little crystals of those accessory minerals which I have mentioned as possessing a special importance in the indications which they furnish.

Turn now to another class of sedimentary rocks, the limestones. These offer a specially inviting field to the amateur worker, in that the preparation of thin slices for the microscope is a much easier and more rapid process with limestones than with igneous rocks. I will cite one point of interest, where petrology comes into contact with conchology. It is well known that lime carbonate exists in nature in two distinct forms, calcite and aragonite, and that both may be secreted by living organisms. In his Presidential Address to the

Geological Society of London in 1879, Dr. Sorby showed that the two forms are to a great extent characteristic of the hard parts of different sub-kingdoms, classes, or genera, although certain organisms secrete both; and further that in many limestones shells originally of aragonite have been converted to the more stable form, calcite.

The question is evidently one which has a bearing on biology, and perhaps on climatology. It has recently been reopened, with the result of showing that there is still much to be learnt concerning both the mineral constitution of shells and the conditions of preservation of fossils. I mention the matter chiefly to point out how much research is facilitated by improved methods of working. Sorby discriminated calcite and aragonite by means of their different specific gravities. The use of a heavy liquid would now make this much easier; but a simpler test is afforded by boiling in Meigen's solution,* which stains aragonite violet, but leaves calcite unchanged.

It would be easy to cite other lines of inquiry in connection with sedimentary strata, which were opened out by Dr. Sorby, but still await final settlement. There is, for instance, the conversion of limestone to dolomite. We know that a calcareous deposit may be dolomitized almost contemporaneously with its accumulation or, on the other hand, by an accession of magnesia in some form at a long posterior time; but the relative importance of the latter factor, the conditions under which the process is effected, its possible relation to depth and pressure, are questions still agitated. Might not some light be thrown upon them by carefully conducted study of the Permian limestone of the South of Yorkshire or the Carboniferous of the West? Here again we may note that the practical differentiation of calcite and dolomite is now made easy by a coloration test: Lemberg's solution† stains calcite, but not dolomite. Among cognate problems is that of the replacement of limestone and calcareous fossils by silica, a change which may be observed in various stages in some of our Corallian strata; and again the conversion of limestone to ironstone, which has made possible the principal industry of the Cleveland district.

(*To be continued*).

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* A dilute solution of cobalt nitrate, free from iron.

† A solution of aluminium chloride, heated with logwood. The solution is applied to the substance for 5 to 10 minutes.

THE BORING HABITS OF THE PHOLAS.

JOHN IRVING, M.D.,
Scarborough

Mr. W. Harrison Hutton's experiments with *pholades*, as related in the December issue of 'The Naturalis ,' p. 423, are of interest as confirmatory evidence of observations made by other marine workers.

Occasionally some naturalists still obtrude an ancient untenable theory, that these molluscs secrete an acid to facilitate boring operations, regardless of the fact that any acid, capable of chemically acting on stone, would destroy the shells and tissues of borers. Other theorists lay too much stress on the strength, conformation, and structural peculiarities of shells, and pay too little attention to the erosive effect of sea-water continuously applied.

Mr. Hutton indicates the process as a simple one, due to shell attrition under the influence of water, and rightly concludes that it begins at a very early stage, when the infant bivalves, fortuitously or otherwise, find their niches in depressions, or irregularities, or crevices in the rocks. These tiny pits, which temporarily accommodate the young *pholades*, are the softer parts of the rock already being excavated by the sea. They are often lined by a film of sticky mud to which the youngsters, almost microscopic in size, easily adhere, and by which they are practically glued into position as the mud increases through continued rock disintegration. Slowly but surely they gravitate, foot downwards, until they are half buried in semi-liquid material, when rotary movements commence to shape their destiny. Their shells, owing to their extreme fragility at this stage, are of minor importance compared with the aqueous element. All *pholades* bore perpendicularly. All entrance apertures remain small, yet the bore gradually and regularly increases in calibre, from above downwards, in exact correspondence with the growth of the animal.

Those who have frequent opportunities of examining stone-borers and their excavations, know full well that, barring accidents, they are life tenants of their holes. There are no exits for them. The adult *pholas*, outside its retreat, is a helpless being. Without a *point d'appui* it cannot bore. Thrust into an artificial cavity which keeps it erect, foot downwards, the difficulty is partly overcome, but this never occurs in the sea, and so the ill-fated mollusc that bores through a rock, too thin for its purpose, becomes food for the crabs. The *sine qua non* of a *pholas* hole is an aperture just sufficient to permit extrusion of siphuncles into water above, and prevent entrance of undesirable guests, and a base whose greatest diameter perfectly agrees with the greatest width of shells. *Pholades*, therefore, do not bore beyond their extended length, nor in calibre beyond the size of their shells; to do so would be to court disaster.

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Pholas dactylus does not occur at Scarborough. Probably Mr. Hutton refers to *Pholas crispata*, which is very common, and which, with *Pholas candida*, may be found in light slate-coloured clay both in North Bay, and in Carnelian Bay. *Pholas crispata* also occupies soft sandstone, and grey limestone, rocks in South Bay.

Saxicavæ bore into the harder limestone rocks, and possibly depend even more on the help of water than the *pholades* do. It is much easier to discover young *saxicavæ* than the young of the *pholas*, as they are more plentiful, and may be seen at a higher tide level. Invariably they are anchored to stone, by a slight but sufficient byssus, which prevents their being washed out of their crannies. The rock being hard, yields much more slowly than that selected by the *pholas*, and, as *saxicavæ* bore more or less horizontally, the process of entry from the rock face necessitates a cable to maintain the creature long enough *in situ* to effect its purpose.

We regret to hear of the death, which occurred last year, of our contributor, Miss Mary L. Armitt, of Rydal Cottage, Ambleside. Miss Armitt was a true naturalist, as the tone of her communications clearly indicated. One of her latest papers appears in 'The Parents' Review' for December last, and is entitled 'Seed-time with the Birds.' At the foot of this paper, the editor, Miss C. M. Mason, gives the following interesting note :—'The "lake country" has been made the poorer by the loss of two accomplished sisters, Sophia (died June 1908), and Mary L. Armitt (died July 1911), Sophia Armitt, like Solomon, knew plants, from the hyssop that groweth upon the wall to the cedar of Lebanon, was familiar with almost every British plant in its own habitat and with its proper environment. Her sister knew birds, with what sweet intimacy, the above paper will show.

'The "Parents' Review" has been from time to time enriched by many papers written by the sisters, of perennial value, because they chronicled personal observations. These were published so long ago that they are probably unknown to the present generation of readers, and we purpose to reprint next year a series of observations, recorded month by month, by Sophia Armitt. We are glad to take this opportunity of expressing our gratitude to two sisters for whose sake distinguished botanists, birdmen, and archæologists sought out "Rydal Cottage" and its charming mistresses, whose stories of varied knowledge and their wide interests were at the disposal of their humblest neighbours. Miss Mary L. Armitt, who probably represents the mind of both sisters, has left a final evidence of the love of knowledge which characterized them, and of their strong sense that no greater benefit than the spread of knowledge can be conferred upon a neighbourhood, by a munificent legacy for the founding and endowment of a public library at Ambleside.'

By her will Miss Armitt left over £5000, and her books, to found and maintain a public library in or near the parish of Ambleside.

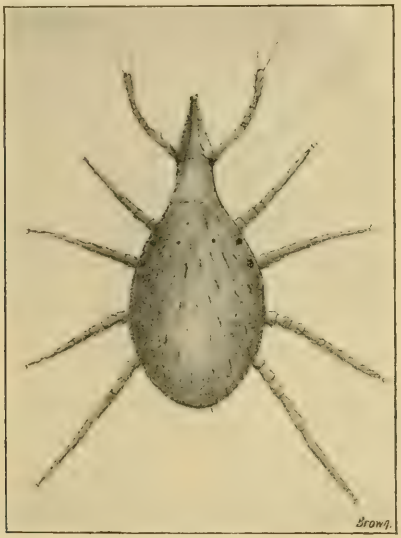
The following is an extract from the will in reference to the matter :—'The aim of the bequest is not to furnish a Free Library for the town, but to create a collection of books of scientific, literary, or antiquarian value, which may be made available to the student and to the book-lover. . . . . This collection might be housed, to start with, in the simplest manner . . . . With the books might be housed such objects of antiquarian or personal interest as would be secured by gift or purchase, and eventually a museum might be made that should illustrate the life of Ambleside, through the long past to the present.'

Naturalist,

BDELLA HEXOPTHALMA GERVAIS.

C. F. GEORGE, M.R.C.S.,
Kirton-in-Lindsey.

THIS remarkable little mite has not, so far as is known, been previously recorded as British. It is described and figured by Gervais, in Walckenaer's 'Apteres,' where he states he found it near Gentilly, in the neighbourhood of Paris. It differs greatly in colour from all the other specimens of *Bdella* I have met with, being yellow, verging on orange; whilst usually they are dark red. It has also six beautiful carmine-red spots, called eyes—two on each side of the cephalothorax, the lenses



Bdella hexopthalma (× 26).

of which are easily made out, and two other smaller ones on the upper surface or dorsum of the cephalothorax, also described as eyes, each one of which has a tactile hair near to it on its outer side, as shewn in Mr. Soar's accompanying figure. In other respects its anatomy appears to be very similar to the ordinary *Bdella*, which is not uncommon in our gardens; in moss and under pieces of wood where small insects have sheltered, etc. I have found it also in a deserted small bird's nest. It is, I believe, *Bdella vulgaris* (*Scirus vulgaris* of Hermann).

My specimen of *B. hexopthalma* was found in this neighbourhood by Messrs. Roebuck and Musham, when investigating the Mollusca of the district in the last two days in August, 1911.

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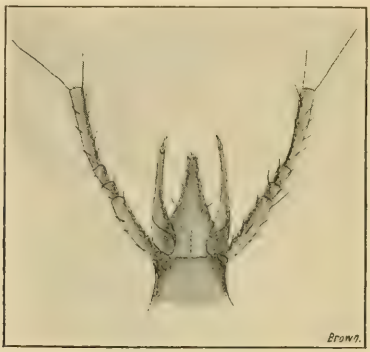
They were only able to capture one specimen, but saw others which were too nimble for them.

Mr. Soar gives an enlarged figure of the creature's proboscis—by which these mites are recognised, and hence called 'snout mites' ('Schnabel milben').

Many minute mites are best examined when alive, as colour is evanescent. A good plan to keep them alive for some time is to use a plug of cotton wool, instead of a cork, as a stopper for the tube in which they are confined, as this is not air-tight, and can be kept moist with a little water. Under these con-



Proboscis of *Bdella hexopthalma* (× 60).

ditions the mites will live a long time, whilst if allowed to become dry, they die and shrivel up and can only be examined with difficulty.

If they are not to be kept alive, they may be placed at once in some preservative solution, and may then be examined at leisure. Mounted specimens are desirable as records, but do not always shew clearly all the points necessary for identification.

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'Jays in London' (*British Birds*, December 1911, p. 192).

A Spoonbill was shot at the mouth of the Welland, Lincolnshire, on November 13th—(*Field*).

We learn from *The Museums Journal* that Dr. Tempest Anderson of York recently opened a new Museum at Batley, Yorkshire.

A report of the annual meeting of the Entomological Section of the Yorkshire Naturalists' Union, by Mr. Porritt, appears in *The Entomologist's Monthly Magazine* for December.

The slipper limpet or boot shell, an importation from America, which is now found on English Oyster beds, is described in *The Zoologist*, No. 845, by Dr. J. Murie. This species was recorded as found in Lincolnshire, in the pages of *The Naturalist*, for 1888. In the same issue of *The Zoologist* Mr. A. W. Brown refers to the boring habits of *Pholas crispata*, and the editor draws attention to 'The Angler as a Factor in the Distribution of Earthworms.'

Naturalist,

THE BEETLES OF THE SCARBOROUGH DISTRICT.

E. CHAS. HORRELL.

For the purpose of the records of the Scarborough Field Naturalists' Society the Scarborough district extends along the coast from Whitby on the north to Flamborough on the south, and inland from Flamborough through Weaverthorpe Village to Pickering, and thence following the railway line to Whitby. The area thus circumscribed shows considerable diversity of surface and affords an unusually rich district for the study of Natural History in all its branches. The beetles have been in the past well studied, especially by Messrs. R. Lawson and Wilkinson, and the Rev. W. Hey, and from the list of Yorkshire Coleoptera by the last-named in the Transactions of the Yorkshire Naturalists' Union and from the List in the Victoria County History, I have been able to compile, with the aid of Mr. E. G. Bayford, a list of 937 species or varieties recorded from the District, and during the last season I have determined the following which have not been previously recorded. All these have been very kindly confirmed for me by Mr. Bayford, and unless otherwise noted have been found by myself.

The asterisk (*) denotes new to the Yorkshire Fauna, and the dagger (†) new to the North Riding.

Notiophilus aquaticus L. Falling Foss.
Leistus spinibarbis F. Langdale End.
Amara acuminata Payk. Raincliffe Woods, Scarborough.
Bembidium andreæ F. Filey.
B. paludosum Panz. Forge Valley.
Tachypus flavipes L. Forge Valley.
**Rhantus pulverosus* Steph. Scalby Beck.
Astilbus canaliculatus F. Forge Valley.
Tachyusa constricta Er. Forge Valley.
Hypocyptus longicornis Payk. Raincliffe Woods.
Tachyporus obtusus L. Forge Valley.
T. obtusus L. var. *nitidicollis* Steph. Cloughton.
**T. pallidus* Sharp. Langdale End.
Quedius cruentus Ol. Forge Valley.
Xantholinus longiventris Heer. Forge Valley.
X. linearis Ol.
Othius læviusculus Steph. Raincliffe Woods.
Stenus biguttatus L. Scalby Beck.
Omalium striatum Grav. Raincliffe Woods.
Anthobium ophthalmicum Payk. Hey Brow, Scalby.
Proteinus ovalis Steph. Forge Valley.
Bryaxis impressa Panz. Forge Valley.
Silpha nigrita Creutz. Scarboro'.
Anatis ocellata L. (leg. A. E. Wallis). Raincliffe Woods.
Attagenus pellio L. Scarborough.
Adrastus limbatus F. Langdale End.
Lampyris noctiluca L. Cloughton : Thornton Dale.
†*Meloë violaceus* Marsh (leg. A. E. Peck). Falling Moss.
Otiorrhynchus atroapterus Deg. Langdale End.
Exomias araneiformis Schr. Raincliffe Woods.
Phyllobius viridicollis F. Thornton Dale.
Philopedon geminatus F. Cloughton.
† *Atactogenus exaratus* Marsh. Thornton Dale.

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Barynotus elevatus. Marsh. Scarborough.
Alophus triguttatus F. ForgeValley.
Hyperavariabilis Herbs. Hackness.
**H. murina* F. Forge Valley.
Grypidius equiseti F. Raincliffe Woods.

The addition therefore of these thirty-eight species or varieties raises the number of beetle records for the Scarborough district to 975.

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NOTES ON THE FÆCES OF YOUNG BIRDS.

W. WILSON.

Whilst photographing birds at their nests from my tent, I have had a good opportunity of noting the mode adopted by various species of birds in the removal of the fæces from their nests.

Missel Thrush.—I had three nests under observation, and in each case the male and female parents swallowed the fæces before leaving their nests, with a few exceptions, when they carried them away. In one case the female swallowed three separate fæces during a period of 15 minutes, whilst brooding her young. With another pair I visited every other day until the young left the nest, I noticed on the fourteenth day that the fæces had changed from a white colour to a black and white one. Up to this day the parent birds had swallowed all the fæces, but now they began to carry them away from the nest, and dropped them, whilst flying, when about 20 to 30 yards from their nest.

Song Thrush.—During the last few years I have noticed both male and female parents at different nests swallow the fæces on some visits to their young, and at other visits they have carried them away. In one case I noticed that one female parent swallowed two fæces and carried a third one away.

Blackbird.—The remarks on the Song Thrush also apply to this species.

Ring Ousel.—I had two pairs of this species under observation in 1911. At every visit to the nest, they waited until the fæces were ejected, and then they immediately swallowed them, sometimes they swallowed three at one visit to their young.

Chaffinch.—Both parents of this species carry away the fæces (with one exception, when the male parent swallowed one). A few days before the young leave the nest, the parents discontinue to remove the fæces, and the outer side of the nest becomes covered with them, which makes it very noticeable.

With Redstarts, Redbreasts, Willow Wrens, Dippers, Great Tits, Pied Wagtails, Yellow Wagtails, Grey Wagtails, Meadow Pipits, Spotted Flycatchers, House Sparrows, *Lesser Redpolls, and Starlings, I notice that the parents carry away the fæces; but I cannot say definitely whether the Great Tits and Starlings carried all away, but they regularly left their nesting sites with the fæces in their beaks.

Kingfishers.—I had two pairs of Kingfishers under observation in 1911, and on no occasion did I see them carry away the fæces, although they occasionally removed pieces of fallen earth from their nesting holes. On examining their nests, only ejected fish-bones were to be found, so I assume this species also swallows the fæces of their young.

From the preceding it will be seen that the larger species, such as the Thrushes, Blackbirds, and Ring Ousels, usually swallow or carry away the fæces, where as the smaller species generally carry them away.

Why the fæces are carried away is evidently a habit of cleanliness, or to avoid attracting the notice of their enemies; but why some species swallow them appears to be unknown.

If the consumption of these fæces had any ill effect on the birds, presumably they would soon discontinue the practice. I therefore venture to suggest that one of the following reasons accounts for the swallowing of the fæces by the parent birds:—

1. There is nourishment derived from the fæces by the parents.
2. There is matter in the fæces which either helps to remove or counteract some disorder in the parents, which may be the result of close sitting during nidification.
3. The ejected fæces contain some food which the young cannot digest, but which is acceptable and digestable by the parents.

In *The Entomologist* (No. 583) are numerous records of *Sphinx convolvuli* (the Convolvulus Hawk Moth), including notes from the Isle of Man, and Manchester. There are also some notes on Durham Lepidoptera.

In *The Journal of the Quekett Microscopical Club* (No. 69), Mr. C. D. Soar has an interesting paper on 'The Work of the late Saville-Kent on British Hydrachnids' (water mites); and there is a valuable but incomplete paper by Saville-Kent on 'Contributions to our Knowledge of the Hydrachnidæ.'

* Redpolls.—Mr. Arthur Duckworth informs me, that when he had the above-mentioned Redpolls under observation—(which was at a time when the young were about seven days older than the date at which I made my notes)—he noticed that the fæces were swallowed by both parents at some of their visits to the nest, and at others they were carried away; occasionally, when they found one on the outerside of their nest, they picked it off and at times swallowed it, at others they carried it away

YORKSHIRE ARACHNIDA IN 1911.

WM. FALCONER,
Slaithwaite, near Huddersfield.

In addition to the thirteen species of spiders new to the county, found in 1911, (see 'The Naturalist,' Jan. 1912, p. 29), the following notes have been made by the Committee :—

The mountains in the West, and the neighbourhood of the sea, have proved as usual during the year the most profitable areas to work for additions to our list, and will probably continue to be so. Great tracts in various parts of the county, in which new spiders will probably occur, still await an investigator.

Many interesting cases of abnormality, chiefly in the direction of eye suppression and the malformation of defective development of the palpal organs of the male, have come to hand. At Slaithwaite, in May, a male of *Hilaira excisa* Camb. in which the elevation and the excisions of the caput were totally wanting, was taken, but the most extraordinary instance was that of an immature male of *Enidia bituberculata* Wid. (Mr. J. W. H. Harrison), from the Middlesbrough district. I am indebted to Rev. J. E. Hull, vicar of Ninebanks, Northumberland, for the particulars concerning it. It is furnished with two additional bona-fide eyes, which are the smallest of the 10, but perfectly distinct, quite symmetrical in form and position, and placed between the central and lateral eyes of the posterior row, but a little further back on the cephalothorax. There is apparently no previous record of such a reduplication of the eyes.

On October 6th, the morning mild and sunny, with a gentle breeze from the south-west, an interesting series of aerial flights, a method by which many spiders are able to disseminate themselves, was witnessed. The threads of the flying spiders became entangled in some elevated iron railings fixed in a large asphalted enclosure, 48 yds. by 28 yds., whereby the progress of the little aeronauts was arrested. The great bulk consisted of adults of both sexes of *Erigone promiscua* Camb., with several *Erigone atra* Bl., and *Dicymbium nigrum* Bl., a pair of *Savignia frontata* Bl., a male *Bolyphantes luteolus* Bl., two immature *Leptyphantes*, a pair of *Centromeria concinna* Thor., and one male *C. bicolor* Bl. This occurred at Slaithwaite.

In the following list of rare Yorkshire species, none is included which has already received notice in any of the reports of the various meetings held during the year (*Vide* " Naturalist," June, pp. 233-5, and October, pp. 363-4), or in Mr. Winter's " Additions for the Airedale and Wharfedale Area," *infra.*

Dysdera crocota C. L. Koch. Middlesbrough. ♀. J. W. Harrison.
Prosthesima petiverii Scop. Skipwith Common. One immature ♀. Second Yorkshire example. New to E. Riding.

Agroeca brunnea Bl. Storthes Hall Wood, Huddersfield. ♀. Second Yorkshire locality. New to W. Riding.

Scotina celans Bl. Carr Wood, Woodsome, Huddersfield. Second Yorkshire example. ♀.

Chiracanthium carnifex Fabr. South Cave. ♀. T. S. Second Yorkshire record.

Argyroneta aquatica Latr. Askham Bog, York, reported by Mr. J. W. Harrison. Ayton (boys of Middlesbro' High School).

Cicurina cinerea Panz. Seven Arches, Saltaire. ♀. J. A. Butterfield.

Hahnia helveola Sim. Deffer Wood, Cawthorn. ♂.

H. nava Bl. Basedale. ♀. Second Yorkshire example. J. W. H. New to N. Riding.

Onesinda minutissima Camb. Wilton Wood, N. Riding. ♀. J. W. H.

Robertus neglectus Camb. Grassington and Howden Ghyll, Keighley. 2 ♂. W. P. Winter.

Floronia bucculenta Clerck. Skipwith Common. ♀. W. P. W.

Linyphia pusilla Sund. Withernsea Carrs. 3 ♀. T. Stainforth.

Lepythantes angulatus Camb. Ingleborough. ♀. W. P. W. Second Yorkshire locality.

Bathyphantes setiger F. O. P. Cb. Ouse Bank, Selby, and Riccall Common. 2 ♀. W. P. W. and W. F. Second Yorkshire record.

Porrhomma miserum Camb. Wilton, N. Riding. Several examples. J. W. H.

Hilaira uncata Camb. Skipwith and Riccall Commons. ♀. New to E. Riding.

Centromerus arcanus Camb. Basedale. Abundant. J. W. H.

C. expertus Camb. Skipwith Common. 2 ♀.

C. sylvaticus Bl. Deffer Wood, Cawthorn. Abundant. Both sexes.

Halorates reprobus Camb. Marfleet Creek. 1 ♂ and 7 ♀. T. S.

Mengea warburtonii Camb. Skipwith Common. Both sexes. W. F. Hornsea Mere. Both sexes. T. S.

Mengea scopigera Grube. Lower Dungeon Wood, Shipley. 2 ♂. W. P. W.

Phaulothrix huthwaitii Camb. Sewerby Cliffs, Bridlington. Both sexes. T. S. New to E. Riding. Skipwith Common. Both sexes. W. P. W., W. F.

Oreonetides firmus Camb. Royal Clough, Pole Moor, Huddersfield. 1 ♀. Deffer Wood, Cawthorn. First Yorkshire ♂.

Diplocentria rivalis Camb. Morton Moor, Bingley. ♂. W. P. W.

Tmeticus affinis Bl. Hornsea Mere, 2 ♂. T. S.

Gongylidiellum vivum Camb. Skipwith Common. ♂.

G. paganum Sim. Ainley Place, Slaithwaite, and Deffer Wood, Cawthorn. 2 ♀.

Notioscopus sarcinatus Camb. Basedale. Abundant. J. W. H.

Diplocephalus beckii Camb. Storthes Hall Wood, Huddersfield. 3 ♀.

D. protuberans Camb. Ainley Place, Slaithwaite. 3 ♂.

Hypselistes jacksonii Camb. 1 ♂ and 4 ♀. Eston. Oct. J. W. H. Fixes time of maturity previously unknown.

Typhochrestus digitatus Camb. Eston. ♀. J. W. H. New to N. Riding.

Styloctetor penicillatus Westr. Rudston, E. R. ♀. T. S. Grassington. 1 ♀. W. P. W. Storthes Hall, Huddersfield. 2 ♀.

Wideria fugax Camb. Deffer Wood, Cawthorn. ♀.

Cornicularia Kochii Camb. Grangetown. ♂ and ♀. J. W. H. New to N. Riding.

C. vigilax Bl. Eston. ♀. J. W. H. Second Yorkshire example.

Pachygnatha listeri Sund. Elam Wood, Keighley. 2 ♂.
Hurst Wood, Shipley, J.A.B., and Dungeon Wood, Shipley, W. P. W. Deffer Wood, Cawthorn. ♂.

Meta menardi Latr. Kelcove and Little Kelcove Caves, Giggleswick, cave in Kingsdale, and old lead mine, Grassington. Mr. Cuthbert Hastings.

Epeira patagiata C. L. Koch. Adults, both sexes. Skipwith Common.

Pisaura mirabilis Clerck. Robin Hood's Bay. ♀. T. S. Second Yorkshire record.

Pirata hygrophilus Thor. Hurst Wood, Shipley. Both Sexes. W. P. W.
Attus pubescens Fabr. ♂. Hull. W. C. England.
Evarcha falcata Bl. Storthes Hall Wood. Huddersfield. 2 ♂.

HARVESTMEN.

Oligolophus palpinalis Herbst. Storthes Hall, Huddersfield. Deffer Wood, Cawthorn.
Nemastoma chrysomelas Herm. Ainley Place, Slaithwaite. Deffer Wood, Cawthorn.

Mr. W. P. Winter writes :—As far as the Airedale and Wharfedale area is concerned, the season has been fairly successful, and there are new records or new reports of old records since " The Naturalist " of last January, of 29 spiders and 1 pseudoscorpion, making now 201 spiders, 17 harvestmen, and 2 pseudoscorpions, or 220 arachnids altogether.

Notices of some of these have already appeared in " The Naturalist " during the year. Others not previously recorded are the following. The finder's initials or names are attached, except in the case of my own collecting.

For 1910 or previous years.

Argyroneta aquatica (Latr.). Imm. ♀. Sept. 1908. Austwick Moss. Mr. C. Waterfall.
Leptyphantes flavipes (Bl.). 3 ♂. Oct. 15th. Shipley Glen.
Hilaira uncata (Cambr.) ♀. Dec. 6th. Elam Wood, Keighley.
Centromerus expertus (Cambr.). ♂, and *Tm. rivalis* (Cambr.), Sept. 21st, 1907. Ascent of Ingleboro' from Clapdale. Mr. W. Falconer.
Microneta saxatilis (Bl.). ♂. Sept. 6th. Ingleboro'.
Gongylidium rufipes (Sund.). ♀. Dec. 6th. Elam Wood, Keighley. Mr. Rosse Butterfield.
Gongylidiellum paganum (Sim.). ♀, and *Evansia merens* (Camb.). ♀. Under bracken. Aug. Rivock, Keighley.
Ceratinella brevis (Wid.). ♀. Oct. 1st. Hurst Wood, Shipley.
Pisaura mirabilis (Clerck). June. Near Keighley. Mr. Rosse Butterfield.

For 1911.

Prosthesima latreillei (C. L. K.). ♀ imm. and ♂. June 6th. Under stones, Grass Woods. W. P. W.
Zora maculata (Bl.). ♀. June 6th. Grass Woods.
Theridion denticulatum (Walck). ♀. April 22nd. Bolton Woods. Francis Perry.
T. tepidariorum (C. L. K.). ♀. Feb. 17th and *T. varians* (Bl.). ♀. June. Gardens at Whetley Hill, Bradford. Mr. W. J. Forrest.
Antistea elegans (C. L. K.). ♀. June 19th. Hurst Wood, Shipley.
Leptyphantes tenebricola (Wid.). ♂. May 23rd. Elam Wood, Keighley.
Bathyphantes pullatus (Cambr.). ♂. June 7th. Hurst Wood, Shipley.
Microneta beata (Cambr.). ♂. June 6th. Grassington.
M. innotabalis (Cambr.). ♂. June 8th. Grass Woods and *M. cauta* (Cambr.). ♀. June 9th. Arncliffe. Both Mr. W. Falconer.
Lophomma punctatum (Bl.). ♀. April 19th, and *Walckenæra nudipalpis* (Westr.). ♀. May 9th. In Hurst Wood, Shipley.
Troxochrus hiemalis (Bl.). ♂, and *Cnephalocotes elegans* (Cambr.). ♀. June 9th. Malham. Mr. W. Falconer.
Trochosa picta (Hahn). Imm. ♀. June. Whetley Hill, Bradford. Mr. W. J. Forrest.

From Mr. S. S. Platt we have received a reprint of an interesting paper on a stone celt found at Rochdale.

YORKSHIRE ENTOMOLOGY IN 1911.

A. WHITAKER AND E. G. BAYFORD.

ABOUT forty members and associates attended the successful Annual Meeting of the Entomological Section of the Yorkshire Naturalists' Union at the Leeds Institute on October 28th last. The president of the section, Mr. Arthur Whitaker, occupied the chair.

Amongst the many interesting exhibits, mention might be made of four specimens of *X. ocellaris* from the Thames valley, fine varieties of *L. gueneei* and a beautiful *B. repandata* var. *conversaria* shown by Mr. Porritt; vars. of *A. betularia* and *P. chi*, and also a very curious and striking aberration of *M. fluctuata*, all from the Skelmanthorpe district, exhibited by Mr. Morley. Varieties of *P. chi* from Bradford district were brought by Mr. J. W. Carter. Series of *P. chi* and *A. betularia* from several localities in Yorkshire, and a number of *Z. loniceræ*, showing considerable variation, were exhibited by Mr. Hewett. A case of insects mounted in their characteristic resting attitudes was shown by Professor Garstang. Varieties of *P. chi* and *O. filigrammaria* from Huddersfield district were contributed by Mr. Cocker. A fine melanic form of *A. menyanthidis* from the Penistone Moors, along with an abnormal specimen of *H. pennaria* and several other interesting moths were exhibited by Mr. Dyson. A number of fine selected forms of *A. grossulariata*, including the varieties *varleyata*, *semiviolacea*, etc., bred by Mr. James Lee, and varieties of *A. grossulariata* from Hull, were shown by Mr. Boult; and from Huddersfield neighbourhood by Mr Wright. Fine varieties of *A. betularia* and *P. chi*, were brought by Mr. Lofthouse. An interesting melanic specimen of *A. atropos*, and a series of *C. suffumata* var. *porritti* were exhibited by Mr. Hooper; and a pale yellowish variety of *V. C-album*, and varieties of *A. betularia* and *P. chi* by Mr. Whitaker.

Mr. Morley read a paper on the 'Reversion of *Polia chi* from melanic to type form in the Skelmanthorpe district during the past summer.' This phenomenon was attributed to the hot season. All the metamorphoses of the species took place in one or other of the protracted droughts of the summer; and as a consequence imagines appeared fully a month earlier than in 1909 or 1910. Mr. Morley suggested that the reversion was evidence that the melanism of this species was a result of damp and sunless weather, and was not produced by the elimination of light forms by enemies. Mr. Porritt said these observations were fully in accordance with his own experiences, extending over many years. Dr. Corbett suggested rearing the species under dry and damp conditions, and noting the results. A good discussion followed.

Mr. Denison Roebuck read an essay by Mr. E. A. Butler, on 'Hints on Collecting Hemiptera.' The varied habitats and times of appearance of the different species belonging to this neglected order were detailed.

Mr. T. A. Lofthouse contributed a paper on '*A. betularia*.' The essayist had ascertained the dates when the variety *doubledayaria* first made its appearance in different districts. From the first record of the form at Manchester in 1859 its gradual increase was traced, and the date of its first appearance in numerous localities, both in our own country and on the Continent, were enumerated. Results obtained by breeding from the black form crossed with the type were given, and well illustrated by actual specimens. It was suggested that the probable cause of melanism in this species was a smoky atmosphere, and that it was most likely a case of reversion to an earlier form of insect. A discussion followed.

Mr. E. G. Bayford read a paper on 'Ichneumons,' which had been written by Mr. Claude Morley.

Several species of Coleoptera were exhibited by Messrs. E. G. Bayford,

H. H. Corbett, W. J. Fordham, W. Hewett, E. W. Morse, and M. L. Thompson. The most interesting of these were as follow:—

Carabus nitens L. Rombald's Moor.
**Blethisa multipunctata* L. Bubwith.
Miscodera arctica Payk. Kildale and Middlesbrough.
Pterostichus vitreus Dej. Grangetown.
Pterostichus authracinus Ill. Bubwith.
Anchomenus micans Nic.
Bembidium lunatum Duft.
† ,, *bipunctatum* L. Eston..
Hydroporus longulus Muls. Kildale.
Agabus affinis Payk. Aberlady.
* ,, *femoralis* Payk. Skipwith.
,, *abbreviatus* F. Askham Bog.
† *Helophorus arvernicus* Muls. Kildale.
† *Hydrochus angustatus* Germ. Bubwith.
Hypocyptus læviusculus Man. Bubwith.
**Ocypus fuscatus* Grav. Bubwith.
**Leptacinus formicetorum* Mark. Doncaster.
†*Stenus nitens* Steph. Thorne.
**Coprophilus striatulus* F. Bubwith.
Homalium punctipenne Th.
† *Acrulia inflata* Gyll. Doncaster and Newnham.
Silpha dispar Hbst.
Colydium elongatum F. New Forest.
Gnathoncus nannetensis Mars.
†*Monotoma spinicollis* Aube. Doncaster.
† *Læmophlœus pusillus* Schön. Barnsley.
Læmophlœus ferrugineus Steph. Barnsley.
† *Psammœchus bipunctatus* F. Askern.
Mycetophagus piceus F.
Megatoma undata L.
Cryptohypnus sabulicola Boh. Symond's Yat.
Corymbites æneus L. Doncaster.
Ancistronycha abdominalis F. Middleton-in-Teesdale.
Hedobia imperialis L. Bubwith.
* *Rhizopertha pusilla* F. Barnsley.
† *Ennearthron cornutum* Gyll. Wheatley.
* *Aromia moschata* L. Skipwith.
† *Clytus arcuatus* L. Woodyard, Doncaster.
**Saperda carcharias* L. A fine ♀, from a York woodyard.
Saperda scalaris L. Chatsworth.
Clythra quadripunctata L. Wentbridge.
Chrysomela goettingensis L. Kellingley.
Hallomenus humeralis Panz. Roundhay.
Salpingus æratus Muls. Grimethorpe.
Salpingus foveolatus Ljungh. Roundhay.
Macrocephalus albinus L. Newnham.
Tropideres niveirostris F. Symond's Yat.
Otiorhynchus rugifrons Gyll. Grangetown.
* *Exomias araneiformis* Schön. Bubwith.
Barynotus schönherri Lett. Aberlady.
* *Alophus triguttatus* F. Bubwith.
Limobius dissimilis Herbst. Richmond.
Myelophilus piniperda L.
Platypus cylindrus F. Symond's Yat.

* signifies the first record for the Riding.
† signifies an addition to the County List.

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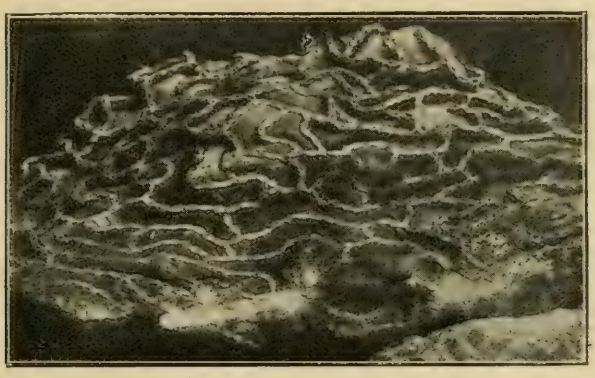
The Adventures of Jack Rabbit, by **Richard Kearton, F.Z.S.** Cassell & Co. 248 pp., 6/-.

This is a delightful book for a young naturalist, being written in non-technical language, and printed in large type. In addition to an enormous number of excellent photographs of bird, insect, and plant life, etc., by Mr. Kearton, there are some of beautifully coloured plates taken direct from nature; that of the Speedwell being particularly charming. The book is written in the form of a narrative, and incidentally contains much useful information, which will be appreciated by boys and girls.

FIELD NOTES.

GEOLOGY.

***Halysites catenularia* at Cragg Hill, Yorks.**—On April 15th, 1911, Mr. G. F. Townend of Earby, found the 'chain coral' *Halysites catenularia* in the Coniston Limestone Series at Cragg Hill, near Horton-in-Ribblesdale. This coral is not included in the list of fossils from the Bala Beds given by Prof. McKenny Hughes in the 'Proceedings of the Yorkshire Geo-



logical Society,' Vol. XIV., No. III., pages 249 and 351, and does not appear to have been previously recorded from this locality. Mr. J. Hartley, of Nelson, has kindly photographed the specimen.—J. Holmes, Crosshills, 13th December, 1911.

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BIRDS.

Black-bellied Dipper at Bridlington.—On 14th December 1911, a male Black-bellied Dipper was shot at Bridlington, and sent to R. Stuart of Beverley for preservation. He says that in thirty-one years' experience this is the only specimen he has handled, and his opinion of its rarity is borne out by 'Birds of Yorkshire,' in which only four previous occurrences in the county are recorded.—E. W. Wade, Hull.

The Feeding Habits of Gulls in the Scarborough District.—On several occasions during recent years I have found on the rocks where gulls congregate, pellets of woody fibre, the nature of which I could not determine. Subsequent observation led me to believe that this substance might be the more indigestable parts of turnip; but this seemed to be such an unlikely thing for gulls to feed upon, that I hesitated to decide without proof positive. I noticed, however, that the

birds sit in turnip fields much more now-a-days than formerly ; and one day last week I saw a large flock, comprising several hundred individuals, in a field of turnips close to the cliff top. Observation with the glasses showed that the gulls were pecking at the turnips ; so the following afternoon I secured three birds—two Herring Gulls and one Great Black Backed Gull—as they were returning at dusk from the field to the sea. In each instance, the gullet was crammed with broken up turnip. On examining the roots in the field I found a very large proportion of them broken into by the birds ; and not a little damage must be done in this way as the injured roots quickly rot in wet weather.

At sowing time in this district the gulls scratch up the seed-grain, and feed upon it ; and in places where they congregate on the shore numbers of pellets, composed of the husks of wheat, barley, and oats may be found, having been cast up by the birds. The same thing may be seen again at harvest time ; but the birds do not appear to take the growing grain, merely picking up that which they find upon, or scratch out of, the ground.

I do not remember finding either grain or turnip in any of the many gulls which I dissected say fifteen or twenty years ago, and am of opinion that this change in the feeding habits of these birds is to be attributed to the great increase in their numbers during recent years, rendering it difficult for all to pick up a living on the sea and shore.—W. J. Clarke, 51 Oak Road, Scarborough, January 16th, 1912.

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At the recent annual meeting of the Scarborough Field Naturalists' Society, Mr. H. C. Drake, F.G.S., was elected president for the forthcoming year.

The death is announced of Sir Joseph Dalton Hooker, the illustrious botanist. Sir Joseph was born in 1817, and was a personal friend and staunch supporter of Darwin.

A purse was presented to Mr. Henry Keeping recently, on his retirement from the post of Curator of the Geological Museum, Cambridge. Mr. Keeping had held the post for 50 years.

We regret to notice particulars of the death of Mr. L. B. Ross, of Driffield, formerly a prominent member of the Yorkshire Naturalists' Union, and an enthusiastic botanist and conchologist. He was sixty-five years of age.

In a paper recently read to the Geological Society on 'The Evolution of *Inoceramus* in the Cretaceous period,' Mr. Henry Woods shews that the *Inocerami* found in the Gault, Upper Greensand and Chalk, are descended from two stocks which occur in the Lower Greensand, viz., *I. salomoni* and *I. neocomiensis*.

We have received a 'Price List for prepared Palæarkt Lepidoters,' from which we learn 'the mutual place of fulfilment is Zirlau. Selections of patterns are willingly to serious customers disposition. I accept at any time all offers about palæarkt. and exotic lepitopters, and I purchase original-booties and perfect collections per cash.'

Naturalist,

YORKSHIRE NATURALISTS' UNION

VERTEBRATE SECTION.

Two successful and well-attended meetings were held in the Leeds Institute on November 18th.

Prior to the General Meeting of the Section, the Committees of the Wild Birds' and Eggs' Protection Act, and the Mammals, Reptiles, Amphibians and Fishes, met.

At 3-30 p.m. the chair was taken by Mr. Oxley Grabham, M.A., M.B.O.U., and the various sectional recorders' reports were read.

In connection with the election of officers for 1912, several recommendations were made for the annual meeting of the Union at Heckmondwike.

The general and financial reports of the Yorkshire Wild Birds' and Eggs' Protection Acts Committee were presented; the continued progress and the financial position was satisfactory, thanks to several generous subscribers.

The report of the Mammals, Reptiles, etc., Committee was read, and a revised official list was passed for recommendation at the annual meeting of the Union.

After an adjournment for tea, the evening meeting was commenced by an exhibition of specimens. Mr. W. Hewitt exhibited a case containing two weasels—one the normal type, and an albino variety, which occurs very infrequently with this species, in marked contrast to its near relative the Stoat.

A communication from Mr. Musham was also read relative to the nesting of the Water Vole, several nests of which had been found in north Lincolnshire during the summer, in high and dry places, and built of reed and sedge pith.

Mr. Sydney Smith confirmed the occurrence from his own observations on Skipwith Common, and surprise was expressed that such a course should have been necessary during the abnormally dry summer. A probable explanation is that the absence of water in many of the hitherto inaccessible swamps and ditches has led to the discovery of what may be after all, no unusual habit.

Mr. F. Edmondson, of Keighley, exhibited a small specimen of the Smaller River Lampern taken in the river Aire. Mr. G. Parkin, of Wakefield, shewed beautifully mounted specimens of a variety of the Meadow Pipit, taken near Wakefield; a variety or hybrid of the Black Rat, which suggested close relationship to the Brown Rat. Also specimens of the Short-tailed Field Vole and Red-backed Vole, and various nests of the Long-tailed Field Mouse, shewing the usual type in contrast to adaptations of Whitethroats' nest to which a dome had been added.

Mr. A. Haigh Lumby read a short paper on 'Distribution of Birds relative to Migration.'

Mr. Riley Fortune, F.Z.S., read a paper entitled 'Notes on British Deer,' dealing in an interesting manner with the antecedents, life-history, structural peculiarities, habits, etc., of the Red, Fallow and Roe Deer, the lecture being illustrated by a fine set of slides. Mr. T. M. Fowler gave a paper, 'Glimpses into Bird Life,' illustrated with lantern slides, depicting his close acquaintance and photographic experiences with several very wary birds.

Mr. Oxley Grabham, M.B.O.U., on 'Yorkshire Fresh-water Fishes,' also illustrated by the lantern, gave an instructive and racy address on our county's species most interesting to the angler.

Mr. H. B. Booth, M.B.O.U., shewed a few slides of the recent fish victims in the River Wharfe, near Ilkley, destroyed by an accidental overflow from the gasworks on October 15th, 1911.*

Mr. A. Haigh-Lumby shewed about fifty slides of various natural history subjects, illustrating the possibilities and limitations of vest-pocket camera work in this direction.—A. H. L.

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* See 'Naturalist,' Nov. 1901, page 37.

NEW BOOKS ON GEOLOGY, ETC.

The Geology of the Country around Nottingham, by **G. W. Lamplugh** and **W. Gibson** (72 pp., 2/-), is a distinct improvement upon many of the geological survey publications, inasmuch as it is quite readable and interesting from cover to cover. It is well illustrated, too, by a comparatively large number of reproductions of excellent photographs, which are printed on quite decent plate paper, and the illustrations in the text are not copied from rough sketches of fossils made by primitive man, such as adorn the pages of some of our Government Geological Survey publications. There is also a special chapter devoted to 'Supplementary Notes for Students'! Evidently, the 'powers that be,' whoever they are, seem at last to be realizing that it is not essential in a government publication of this sort to have merely dry statistics, and bare—very bare—facts, with pre-historic woodcuts, badly printed on bad paper. The cover, too, can be handled without one's fingers slipping through the paper, though in our copy it must be admitted the 'cover' is smaller than the pages inside; though this is probably owing to the fact that the covers were cut before the thickness of the plates was allowed for!

We have received three of the excellently printed and well-bound volumes issued by the Cambridge University Press at the extremely low price of 1/- each. They average 150 pages each, and are well illustrated. The first is by **Prof. A. C. Seward,** a past-president of the Yorkshire Naturalists' Union, and deals with **'Links with the Past in the Plant World,'** a subject which he recently touched upon in the pages of *The Naturalist.* He deals with the Longevity of Trees, Plant Distribution, the Geological Record, Fossil Plants, Ferns: their distribution and antiquity, Californian trees, the Maiden Hair Tree; and in addition, he gives an extensive bibliography. On somewhat similar lines, but dealing with the animal world, is **Mr. Geoffrey Smith's 'Primitive Animals.'** This has chapters on the Animal Phyla, Simple Animals and Plants, and the Origin of Life; the Appendiculate Phylum, Embryonic and Larval Histories; the Ancestry of the Vertebrates; the Origin of Land Vertebrates; the Rise of the Mammalia; and on the past and future of animal life. From this enumeration of the contents, it will be seen how exceedingly interesting is the nature of this work. A companion volume, **Life in the Sea,** by **Mr. James Johnstone,** refers to the Categories of Life, Rhythmical Change in the Sea, the Factors of Distribution, Modes of Nutrition, and the Sources of Food. There is also a useful list of authorities. These three volumes have the further advantage of being written in non-technical language.

Waves of the Sea and other Water Waves, by **Dr. Vaughan Cornish.** London: T. Fisher Unwin. 374 pp., 10/- net.

Dr. Vaughan Cornish has long been known for his researches upon all kinds of waves with which geography is concerned. In this book he gives an account of his contributions to our knowledge of water waves. The volume is divided into three parts. The first deals with the size and speed of ocean waves, and their relation to the strength of the wind which produces them. In the second part an account is given of the action of the waves to form shingle beaches, and, in conjunction with the tides, to transport shingle and sand from place to place along the shore. This part of the book is important in connection with the subject of coast erosion. The third part is chiefly devoted to progressive waves in rivers. The origin and nature of the Severn Bore, on which the author has thrown fresh light, is dealt with in detail; and many remarkable observations are recorded of the progressive waves of the Niagara Rapids, of the tendency of shallow streams to flow in gushes, and of other curious phenomena of intermittence which can be detected in cataracts and waterfalls. The work is profusely illustrated by the author's photographs, obtained in many parts of the world. We are glad to be able to recommend the volume

to our readers, as being the first to be entirely devoted to this fascinating subject—a subject which is of far more importance, both scientifically and economically, than is usually supposed. Some interesting observations on northern rivers are given.

Ancient Types of Man, by **Arthur Keith, M.D., LL.D.** London : Harper & Bros. 151 pp., 2/6 net.

Unfortunately we looked at this volume whilst we were busy with some work which was urgently required. The result was the work had to wait. It is most fascinating ; each chapter deals with some well-known type of ancient man ; the Essex, Tilbury, Dartford, Galley Hill, Heidelberg, Neanderthal, Java, etc., remains being graphically described ; and restorations are given.

Characteristics of Existing Glaciers, by **Prof. W. H. Hobbs.** Macmillan & Co. 301 pp., 13/6 net.

In this country, and particularly in the northern counties, much geological work amongst glacial deposits has to be done by many who have had no opportunity of studying modern glacial phenomena in the large glaciated areas of our globe. Glacier-ice at any time is very peculiar in its methods, and cannot always be relied upon to do what it ' ought ' to do, or to go where it ' ought ' to go ; and in dealing with an area glaciated some thousands of years ago, it is not at all unlikely that difficult problems will arise. It is therefore essential that a student of glacial geology should get a good grasp of the nature of the work existing glaciers are doing, and not merely the small ice-streams of the Alps, but the great ice-caps in the Arctic and Antarctic, as ' the present is the key to the past.' Prof. Hobbs has produced the very volume. By the aid of about 200 diagrams and photographs, with the descriptions thereof, he has placed the student of glacial geology in a far better position than he has ever been before. The erratic way in which ice behaves, whether in the form of small glaciers or large continental sheets, is described in detail, and illustrations are drawn from all parts of the world—Scott and Shackleton supplying much material for the book. The following headings to one only, out of the 16 chapters, will give an idea of the thoroughness of the work, and its usefulness to British geologists : Glacial features due mainly to Deposits, abandoned moraines of mountain glaciers, the tongue-like basin before the mountain front, border lakes, stream-action on the mountain foreland, the outwash apron, eskers and recessional moraines, stream action within the valleys during retirement of the glacier, landslides and rock streams within the vacated valley, rock-flows from abandoned cirques, references.'

British and Foreign Building Stones, by **John Watson.** Cambridge : University Press. 483 pp., 3/- net.

This volume is much more than what the author modestly describes as ' A descriptive catalogue of the specimens in the Sedgwick Museum, Cambridge.' It is an excellent handbook and guide to building stones generally ; and besides being very useful to the geological student, will be invaluable to the builder and architect. The first 244 pages are devoted to descriptive notes on building stones of Britain, the colonies, and foreign countries, arranged under the heads of Igneous Rocks (Plutonic), Igneous Rocks (Volcanic), Metamorphic Rocks, and Sedimentary Rocks—the last being arranged in geological age. A perusal of this part of the work shews to what an unexpected extent the various beds in the different geological deposits are used for building purposes. The catalogue proper enumerates over 1100 examples, mostly 4½ inch cubes, with rough, dressed, and polished faces. In addition to the trade and geological names, geological horizons, localities, etc., particulars are given of the nature of the rock, the weight per cubic foot, crushing strain, chemical composition, etc. As every important stone appears to be represented in the Cambridge collection, it will be seen that the volume is one of unusual value. It is also remarkably cheap, and there is a capital index.

REVIEWS AND BOOK NOTICES.

The Young Ornithologist, by **W. Percival Westell.** Methuen & Co. xiv.+308 pp., 5/-.

This is an excellent series of bird photographs by various photographers, made into book form by Mr. Westell's usual talk about the birds; which, under various titles, we have seen over and over again. In the present work, however, he professes to classify the birds according to their environment, though it is evident some have been put under the heads of country lane, meadows, woodland, and 'spacious air,' by the 'heads or tails' principle. The first is the most interesting and most useful chapter; and it is by someone else; for another helper Mr. Westell condescendingly predicts a 'brilliant future.' Many Yorkshire photographs appear amongst the illustrations; the photographers of some of which are thanked, and some are not.

The Natural History and Antiquities of Selborne, by **Gilbert White.** London: MacMillan & Co. 476 pp., 10/6 net.

It is not necessary to recommend this classic to readers of 'The Naturalist.' 'White's Selborne' is the one book that every naturalist worthy of the name has read. Probably a hundred different editions have appeared during the past century. But we can safely say we have not seen one so well produced at so reasonable a cost as this one by MacMillan. It is not spoilt by too much 'editing.' It is printed in large type on good paper, and neatly bound. It is greatly increased in value by 24 plates of Selborne, etc., in colours, by George Edward Collins, R.B.A. We know of no better present for a young naturalist.

The Home Life of the Osprey. Photographed and described by **C. G. Abbott.** London: Witherby & Co. 54 pp., and 32 plates, 6/- net.

This is the third of the Bird Lover's 'Home Life' series, and, if anything, is better than its predecessors. The letterpress is an entertaining account of the habits of the Osprey (which, by the way, still nests within the city limits of New York), and of the photographer's experiences in 'snapping' it. The part of the volume which will appeal alike to naturalist and photographer is that wherein some 42 reproductions of remarkable photographs of the birds and their nesting sites are mounted on suitably tinted paper. Were it not for the fact that 'photography cannot lie' we should hardly have believed that a human being could possibly have been so near this wary bird.

The Kingdom of Man, by (**Sir**) **E. Ray Lankester, D.Sc., LL.D., etc.** London: Watts & Co. 191 pp., 2/6 net.

This volume was originally issued by Messrs. Constable, in 1907, and was noticed in the pages of 'The Naturalist' at the time. It contains Dr. Lankester's Oxford Romanes Lecture 1905, on 'Nature's Insurgent Son'; his British Association Address, 1906, and an article on 'Sleeping Sickness,' reprinted from the *Quarterly Review*. Our readers will probably be glad to hear of the volume in its present cheaper form. Though bearing the date 1911, there is no indication of the author's knighthood, and he is still described as 'Director of the Natural History Departments of the British Museum,' a position he vacated some years ago.

Science from an Easy Chair, by **Sir Ray Lankester.** Methuen & Co. 423 pp., 6/- net.

This volume contains a series of popular articles, originally contributed to the *Daily Telegraph*, and now reprinted in handy form, with illustrations. The subjects dealt with are unusually varied, and include the most ancient men, cave-men's skulls, dragons, oysters, sleep, university training, Darwin's discoveries, camels, cholera, eels, stars, tadpoles, sparrows, green-fly, opium, clothes moths, etc. As a frontispiece is a beautifully coloured plate shewing the 'yellow' or immature eel, and the 'silver' or mature eel.

Physical Science in the Time of Nero, being a Translation of the *Quaestiones Naturales* of Seneca, by **John Clarke,** with notes on the Treatise, by Sir Archibald Geikie. MacMillan & Co. 368 pp. 12/- net.

Early in the seventeenth century Thomas Lodge, the dramatist, published a translation of nearly the whole of Seneca's prose works. Hitherto, however, no English editor seems to have turned his attention to the *Questiones Naturales.* In the present work by Mr. John Clarke, a translation is given, together with an explanatory introduction. Other information is given to enable the volume to be self-interpreting. Sir Archibald Geikie has added a valuable and most readable commentary, in which questions treated by Seneca are considered from the point of view of modern science.

A Garland of Shakespeare's Flowers, compiled by **Rose E. Carr Smith.** London: Eliot Stock. 104 pp. 3/- net.

This little book contains an introduction by Herbert Carr Smith, in reference to the flowers of Shakespeare's days. Then follow sixty well-coloured plates of the plants referred to by Shakespeare, each of which is accompanied by quotations from the plays, etc. The illustrations are after the style of those in Cassell's 'Familiar Wild Flowers,' and for the most part are well done. Botanists, with a taste for Shakespeare, or Shakespearians with a taste for botany, will find this book welcome.

Modern Microscopy, by **M. I. Cross** and **M. J. Cole.** 4th ed. London, 1912. Balliere, Tindall & Cox. XVII.+325 pp. 6/- net.

This well-known 'Handbook for beginners and students" needs no recommendation to our readers interested in microscopy, as they will probably all have got it. In case this should not be so, and in case any are about to take up microscopy, we take this opportunity of saying that a fourth revised and enlarged edition has just been published, with chapters on special subjects by various writers. There are over one hundred illustrations.

A Journal from Japan: A Daily Record of Life as seen by a Scientist, by **Marie C. Stopes, D.Sc., etc.** London: Blackie & Son. 280 pp. 7/6 net.

Dr. Stopes went to Japan in search of coal-balls, and, as we have seen, has made many interesting additions to our knowledge of palæobotany as a result. With introductions from the Royal Society, etc., she had every possible attention paid to her, by the most polite of Orientals. Whilst away she wrote long letters home, for her friends, though they took the form of a 'Journal.' They were not written for the purpose of publication, and therefore, womanlike, Dr. Stopes has published them. And we are glad she did. She seems to have had a happy time, and certainly has a happy way of telling what she saw. Early in the trip, whilst on a train ride, a smart Japanese, well-dressed in perfect English style, sat near her, 'then, the heat becoming great, he took off his coat, then his waistcoat, and finally came to his shirt alone! Then he pulled over him a loose kimono, and removed every stitch but that . . . . all without removing his gold-rimmed glasses or turning a hair!' As many others did the same Miss Stopes wondered if we weren't a little super-prudish in England. On the next night she was on board a steamer. 'The state-rooms have three berths, and I find my two companions are men. It was a shock at first, but they seemed so surprised at my being surprised, that I thought again that we have too much of the trail of the serpent about our customs. I slept in the train with men near me, why not in the steamer. It is only for one night!' Then she took a policeman with her to the mountains. And so on. There is no doubt the editor of 'The Sportophyte' had a delightful time in Japan. Personally, we feel sorry she has omitted the references to what was said and done at the numerous dinners and dances she attended. They might have been interesting! As it is the book is more generally readable than a technical description of the microscopic characters of the palæobotanical contents of a Japanese coal-ball.

PROCEEDINGS OF PROVINCIAL SCIENTIFIC SOCIETIES.

The Annual Report of the Hull Geographical Society shews that the Society has 49 members, a balance in hand of £8 16s. 7d., and has had three works given to form the nucleus of a library.

The Thirty-Ninth Annual Report of the Peterborough Natural History, Scientific and Archæological Society contains a long list of objects added to the Peterborough Museum during the year. It is a pity the list is not arranged in same order.

In the **Proceedings of the Bristol Naturalists' Society** (4th Ser., Vol. II., Part III.), Mr. W. H. Wickes has an illustrated paper on 'Beechite,' and in Vol. III., Part I., Professor J. H. Priestley writes on 'The Pelophilous Formation of the Left Bank of the Severn Estuary.'

Part V. of Mr. S. S. Buckman's **Yorkshire Type Ammonites** has appeared (Wesley & Sons, 3s. 6d.) and contains a copy of the original description and photograph, as well as detailed particulars of *Ammonites sulcatus, scoresbyi, acuticarinatus, compactilis, whitbiense, lectus* and *miles*.

In the **Proceedings of the Cambridge Philosophical Society** (Vol. XVI., Part IV.), Mr. H. Hamshaw Thomas records the discovery of the spores and sporangia of two common Bathonian Ferns, *Coniopteris hymenophylloides* and *Todites williamsoni*, in the Jurassic rocks of Yorkshire.

Vol. III. of **The Year Book of the Viking Club** for 1910-11 (82 pp., 2/6. University of London), includes a detailed report on the Club's year's work, and of its district secretaries. It also includes many notes, reviews, etc. Altogether it is a good report of a good year's work of a good society.

The **Caradoc and Severn Valley Field Club** issues an annual 'Record of Bare Facts,' No. 20 being before us. It includes 'a list of the more noteworthy observations' made by the members of the club, under the heads of Botany, Zoology, [Vertebrates], Entomology, Geology, and Meteorology.

The '**Annual Report of Proceedings** under the **Salmon and Freshwater Fisheries Acts**, etc., etc., for the year 1910' has recently appeared (Board of Agriculture and Fisheries, 1911. xx.+53, pp., 4d.), and contains particulars of the various regulations in force with regard to fishing in the different districts, quantities caught, prices realized, etc.

The **Dumfriesshire and Galloway Natural History, etc., Society,** has published 'Addenda and Corrigenda to the Birds of Dumfriesshire,' being a paper read as his Presidential Address to the society by Hugh S. Gladstone, M.A., F.R.S.E., etc. (31 pp.). Those who have Mr. Gladstone's excellent volume should make a point of securing this supplement.

The Annual Report and Transactions of the Manchester Microscopical Society for 1910 (82 pp., 1/6) is an excellent record. In addition to the details of the Society's work, the publication contains papers on 'Colour in Animals,' by Prof. S. J. Hickson; 'Spirogyra,' by C. Turner; 'Ants,' by H. G. Willis; 'British Social Wasps,' by A. Newton, etc.

Part XVI. of the **Transactions of the Leeds Geological Association** for 1910-11 (41 pp. and plates, 2/-), have been published, under the editorship of Mr. E. Hawkesworth. Besides the reports of meetings and excursions, these contain 'Notes on the Iron-ore Deposits of Lapland,' by 'Nettleton'; 'Cavities in the Magnesian Limestone,' by 'Guy'; 'The Cleveland Dyke' (plates), by 'King'; 'Alluvial Deposits at Woodlesford,' 'Gilligan and Hummel'; 'The Lithology of the Millstone Grits,' 'Pickering'; 'Permian Boulders at Rothwell Haigh,' 'Hawkesworth.' It will be seen that the papers are mostly local in character, and they certainly represent an excellent year's work. Amongst the fossils and other objects exhibited at the meeting on October 21st, 1910, we notice 'The Staff of the Geological Department of the University.' This was evidently a special show, as it is mentioned in large type!

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This Magazine—a continuation of 'The Scottish Naturalist' founded in 1871—was established under the present editorship in January 1892, for the purpose of extending the knowledge of and interest in the Zoology and Botany of Scotland. The ANNALS is entirely devoted to the publication of Original Matter relating to the Natural History of Scotland.

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THE NATURALIST

A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

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THE MUSEUMS, HULL;
AND
T. W. WOODHEAD, Ph.D., F.L.S.,
TECHNICAL COLLEGE, HUDDERSFIELD.

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NOTES AND COMMENTS.

THE 'LANCASHIRE' NATURALIST.

The Editor of the *Lancashire Naturalist* seems greatly concerned that a note referring to his county should have been sent to our journal, but he has 'since received a full explanation of the circumstances, which is wholly satisfactory'! We do not know what the explanation was, nor how the editor dare have demanded one, but probably the author of the note wished his find to have wider publicity than it would have received in the *Lancashire Naturalist*. We would here take the opportunity of pointing out that *The Naturalist* has printed notes bearing upon Lancashire, as well as other northern counties, more than half a century before the Lancashire journal saw the light, and the appearance of the latter journal has not caused us to alter our policy. Nor has the fact that our contemporary has included Cheshire, Derbyshire, Westmorland, the Lake District, the Isle of Man, etc., under 'Lancashire,' necessitated *The Naturalist* neglecting those districts. And if 'Yorkshire' were included under the 'Lancashire' Naturalists' scope, our own journal would probably still live.

NEW PUBLICATIONS.

As a matter of fact, we welcome new publications—particularly local ones. During the past few years we have noted the birth of dozens, and as surely have we soon after recorded their decease. Unless our memory fails us, even the *Lancashire Naturalist* came to an untimely end, but was subsequently revived. But it will not achieve success by pillorying people who do not care to hide their notes in the pages of a small provincial bushel. An author has a perfect right to send his notes where he will. There have been two or three, possibly more, in the *Lancashire Naturalist*, which we might have considered sufficiently important and generally interesting for the pages of *The Naturalist*, but we have not demanded any 'explanation' as to why the papers were not sent to a journal which has been serving the interests of northern naturalists for over three-quarters of a century.

LOCAL PUBLICATIONS.

The reference to local journals reminds us that from time to time, whilst welcoming new publications of strictly local interest, we have deprecated these unless there is a probability of their continuance. On our shelves, in a special 'By-gones' corner, at the present moment there are many 'Vols. I.' or 'Parts I.' of scientific publications, which have not been followed up by others. In other cases, two or three parts have appeared, and no more. As some of these have contained important contributions to science, it is unfortunate. Librarians do not care to stock incomplete publications, and, as we know from experience, it is often very difficult to find a single copy of some of

these Transactions or Journals. The matter is occasionally further complicated by changes in the title of the publication—circumstances which are bound to lead to confusion in the future. A bad case has recently been brought to our notice, from no other place than Hull, and, as it has resulted in two different publications appearing and disappearing within an incredibly short period, we refer to the matter now as a warning to other societies which may be contemplating printing.

NEW SOCIETIES.

Stars of the fifth or sixth magnitude are quite insignificant in an ordinary firmament, but in a firmanent of stars of the tenth and eleventh magnitude only, they appear quite brilliant. In this way a small and enthusiastic band of young men at Hull formed a society of their own, which started well, and was encouraged by the older people, and was helped in every way. We ourselves fell in with their many requests. Some other men, older in years, joined this 'Junior Naturalists' Society,' but, as far as we can make out, everything was carried on on the lines of the older scientific society in the city—saving that in the new society the various presidents, vice-presidents, committees and other positions enabled almost every member to hold an 'important' office of some kind. A library was formed, 'rooms' obtained, including a 'research laboratory,' etc., and great things were naturally expected. The local M.P.'s became patrons, and the Mayor and other important local people were invited to open 'Exhibitions,' etc., and, on paper, all seemed well. Meanwhile the older society worked on in its quiet way, and supplied most of the lectures to the junior society.

A PUBLICATION.

The Junior Society then published 'Vol. I., part 1, of the Proceedings of the Hull Junior Field Naturalists' Society,' which was noticed in our journal at the time.* This contained reprints of papers, already published elsewhere, by fairly well-known writers, and a few short notes by the junior naturalists themselves. As the Editor of the Selborne Magazine said at the time, the publication reminded him of a magazine issued from one of the Universities, which was written by the professors, and 'edited' by the students.

A CHANGE OF NAME.

Then the society, feeling, possibly, that the word 'Junior' might limit its scope, became more ambitious, and altered its name to the 'Hull Society of Natural Science,' with the arms of the city as its crest, and 'Science is nothing but trained and organised common sense' for its motto. Another M.P.

* 1910, p. 161.

and a baronet were added to its list of patrons. But the 'Society' proper, that is the working members, were still the 'junior' naturalists, and still carried on its work in the same junior way. But it must begin to publish a quarterly magazine, quite regardless of the question of L. S. D., or of the question of the contributions being regularly forthcoming. So we find that somewhere about April last (possibly April 1st), appeared Vol. I., No. 1 of the Journal of Natural Science and Photographic and Philatelic News, published quarterly. The words 'Natural Science' were in a very large type, and, being printed on Silurian paper was, at first, remindful of *the* 'Natural Science' of the good old days. But there the semblance ended. On the first page we again find reference to the Journal of Natural Science Photograpic (sic) and Philatelic Notes. The 'Photograpic' notes were confined to one page, and did not refer to photography, and the 'Philatelic Notes' were evidently crowded out, as they could not be found.

WHAT SHOULD NOT BE IN A JOURNAL.

The 'editorial staff' was strengthened, and we turned to the magagine itself, naturally expecting it to be a model. But it is a long time since we saw anything worse. In the two parts before us (yes, there have been *two!*) about every style of type seems to have been used. On one page no fewer than nine different founts occur, and each paragraph is set up in a different faced type! There are mis-prints and wrong letters galore, spacing is faulty; the blocks are not printed on suitable paper, and advertisements are printed on the back of the ordinary matter, so that they cannot be removed in binding. In fact, if one wished to find within the pages of one small pamphlet all the things there should not be, this journal of 'Natural Science' is 'it.'

THE CONTRIBUTIONS.

These are as varied in quality as in title. Unfortunately, there are one or two valuable items amongst them, for which it seems desirable to keep the rest. The notes refer to the Brent Valley Bird Sanctuary, Geology in East Lincolnshire, Opium, Esperanto, Aviation, Shetland, Yeast, Microbes, Electrical Notes, Birds' Eyes, and the Hull Museum! These are illustrated by borrowed blocks, badly produced. There are also reviews of books, which presumably must have been sent to this journal for review long before anybody knew there was going to be such a journal in existence.

A WARNING.

We have said thus much, and have given these details, in the hope that before any other societies commence publishing they will thoroughly consider whether they will be able to

continue to do so. It has not been done to harm this new so-called 'Natural Science' in any way, as we believe it has early gone to the wall in the struggle for existence, on the principle of the survival of the fittest! Anyway, Vol. I., for April-June, 1911, was followed on *November* 4th by part 2 for July-September, and part 3, which for a 'quarterly' should be for October-December, has not made its appearance at the time of writing, towards the end of February!

THE SCOTTISH BOTANICAL REVIEW.

The recent changes which have taken place in connection with the 'Annals of Scottish Natural History" have resulted in the separation of botany and zoology, and the formation of two journals. Zoology is now represented by the 'Scottish Naturalist,' and botany by 'The Scottish Botanical Review,' the latter a quarterly published at 7s. 6d. per annum, the first part of which was issued in January. The editor is Mr. Mc.Taggart Cowan, Jr., assisted by an editorial staff consisting of Messrs. W. Barclay, A. Bennett, and R. H. Meldrum and Drs. A. W. Borthwick. W. G. Smith and J. Stirton.

The 'Review' includes the transactions of the Botanical Society of Edinburgh; and the presidential address by Dr. Borthwick on 'Some Modern Aspects of Applied Botany' forms one of the contributions. Mr. C. B. Crompton deals with 'The Geological Relations of Stable and Migratory Plant Formations,' and the shorter papers include 'Remarks on some Aquatic Forms and Aquatic Species of the British Flora,' by A. Bennett; 'Alien Plants,' by Mr. J. Fraser, and 'Ecological Terminology as applied to Marine Algæ,' by Mr. N. Miller Johnson. There are also several able reviews, book notices, and notes on current literature.

THE LITTLE AUK.

As we went to press with our last number, the county was visited by a short spell of real old-fashioned wintry weather, which resulted in 'sportsmen' having a good time. One effect was that the northern counties were visited by scores of examples of the Little Auk, to account for the presence of which a possible theory is given in the report of the Vertebrate Section of the Yorkshire Naturalists' Union, on another page. Mr. F. Williamson informs us that on February 1st a specimen was caught alive at Rochdale, and lived three days. Others were obtained at Leyburn, Warter, Whitedale, Scarborough, Filey, Keighley, Hull, and even as far as Cumberland and Shropshire. We had a specimen brought to us alive, which was found on the road near Bridlington. It could not be induced to take food, however, and died. It was in excellent condition when found, and was by no means starving.

PETROLOGY IN YORKSHIRE.

ALFRED HARKER, M.A., F.R.S., F.G.S.,
Cambridge.

(*Continued from page 44*).

I will not weary you by enlarging upon numerous other subjects in which work still remains to be done, such as the oolitic structure and its possible connection with organic agency, or the flints in the Chalk, especially in relation to disseminated silica in the rock. The minute constitution and microzoology of the Chalk itself afford a subject which is far from being exhausted. It may be remarked that, while the soft chalk of the South can often be studied only by rubbing down in water, much of our Yorkshire chalk is hard enough for the preparation of thin slices. The non-calcareous portion of our Jurassic limestones, obtained as a residue on dissolving the rock in dilute acid, would doubtless reward a systematic study. By 'systematic' I mean especially comparative, both as regards the different members of a formation and as regards the lateral extent of any one member. A large-scale map, on which to record results, is a useful adjunct to an investigation of this kind.

There remain the igneous rocks. The red colours consecrated by usage to these figure, it is true, very sparingly on the geological map of Yorkshire. The well-known Cleveland dyke and the Whin Sill have been exhaustively studied; but the same cannot be said of the mica-lamprophyre and allied dykes which intersect the Lower Palæozoic strata wherever these are exposed, in the Ingleton and Sedbergh districts, and in Upper Teesdale. The volcanic rocks intercalated in the Coniston Limestone group of the Sedbergh district have not yet received any detailed notice. Nevertheless, we must admit that, in this direction, the field appears a very restricted one.

The prospect is very different, however, if we take into account the glacial boulders which are found in such profusion and variety embedded in the boulder-clays, scattered as erratics over the surface, and accumulating on the sea-beaches from the gradual waste of the clay cliffs. In East Yorkshire, if anywhere in the world, the student of igneous rocks need be at no loss for material; while he has at the same time the opportunity of rendering valuable assistance to glacial geology. Nor has this opportunity been neglected. Here at least our county need fear no reproach; rather may we justly claim for it the credit of leading the way in this particular line. The impetus has come perhaps rather from the glacial than from the petrological side; but this only emphasizes the solidarity of geology throughout its different ramifications; and we may hope that he who has been drawn to petrology for the sake of one of its applications will adhere to it for its own sake,

and for the aid which it can be made to afford to many other problems of general geological interest.

To discuss the specific results already obtained, relative to the dispersal of travelled boulders at different stages of the glaciation, would carry me beyond the limits which I have laid down for myself in this address. Enough that the results demonstrate conclusively the value of concerted and systematic research addressed to a definite end. Local in its inception and in its immediate interest, the investigation is one which necessarily oversteps the boundaries of the county and indeed of the British Isles. Briefly, the problem is to trace the various types of rocks met with among the boulders to their several homes in the North of England, the South of Scotland, and the Scandinavian peninsula. This necessitates, not only a study of the boulders themselves, but a sufficient acquaintance with the rocks of all those districts which can possibly have contributed boulders to our drift deposits. Such areas must be visited for the purpose of procuring representative collections to serve as standards of comparison. Our Yorkshire workers have not been daunted by this comprehensive programme, and to the thoroughness thus evinced is due the special value which belongs to the results obtained in recent years. It is therefore in no critical spirit, but in one of hearty appreciation, that I speak of this interesting application of petrology in the service of glacial geology.

Among the great diversity which the travelled boulders of East Yorkshire present, special importance attaches to strongly marked types which are known to be unique, or at least of very restricted distribution *in situ*. There are many of these, mostly igneous rocks, but they usually make up only a fraction of the whole assemblage. The rest, belonging to less distinctive and sometimes widely distributed types, are of less significance, though they have their weight as cumulative evidence. There are, for instance, large numbers of gneissic and other crystalline rocks which may safely be referred to some Scandinavian source, merely because there is no other area of similar rocks which enters into the probabilities; but it is clearly much more satisfactory when we can assert confidently that a certain boulder has once formed part of a particular hill in Norway. Among the well-defined types which furnish the most precise information, some are easily recognised at sight. Nobody can mistake a boulder of Shap Granite or of rhomb-porphyry; but there are many other rocks, equally useful in tracing the movement of the ice, which cannot be safely identified without microscopical examination. In every such case, I think, the record should state whether this means has been employed, and also who is responsible for the identification given. If only five records in a hundred are doubtful,

and we do not know which five, it is clear that the doubt must extend to the whole list.

Regarded merely as specimens gathered from many sources, without reference to the problems of glacial geology, our boulders provide a rich store of material for the student of igneous rocks. Not to mention such areas as the Lake District and the Cheviot Hills, there is the wonderful series of rocks of the Christiania district, without parallel in our own country. Not a few of the interesting types made known to petrologists chiefly by Professor Brögger have already been recognised among the boulders of Holderness and the coast, and it cannot be doubted that many others will reward a search aided by microscopical study. The preparation of thin sections is now greatly simplified and made easy, and there is no reason why everybody should not make his own sections, as Sorby did fifty years ago, but with much less expenditure of time and labour. A cutting-lathe is not requisite, nor indeed does it now afford any advantage; for, thanks to the use of carborundum as an abrasive, it is less troublesome to grind down a chip than to cut and reduce a slice. The work of making and mounting thin sections of any kind of rocks is thus easily performed at home, and at a trifling cost for material and appliances. Moreover, this procedure has positive advantages. It is possible to ensure that the section shall include precisely the desired part of the specimen, and sometimes useful information may be gained during the operation of grinding. In some cases, too, it is convenient to be able to treat the section with some reagent before adding the cover-slip. Thus, such minerals as nepheline and analcime may be made much more apparent by attacking the surface with hydrochloric acid and then (after washing) staining the gelatinous silica so produced with fuchsine or some other appropriate colouring medium.

It is, I fear, impossible that an address on a special subject, offered to a general audience of naturalists, should succeed in interesting all. My immediate predecessor, my friend Professor Seward, could appeal to two sections at least, the botanists and the geologists, but in this versatility I am not qualified to emulate him. To my non-geological hearers I can only proffer the consolation that their turn will come in due course another year. To the geologists I make no apology for confining the tenour of my remarks to a single branch, inasmuch as my chief object has been to urge the claims of Petrology to a fuller measure of consideration than it has yet received. I have shown it, not as an isolated study, but as an integral part of geological science, having intimate relations with historical geology, physiography, glacial geology, and numerous other lines of inquiry.

I wish to insist upon this aspect of the matter, because I think it rests mainly with amateur workers to preserve that

solidarity of geology, and indeed of natural science as a whole, which is in great danger of being lost in this age of specialisation. Bacon, three hundred years ago, might take all knowledge for his province: to-day he is a bold man who shall attempt to embrace all geology. Rapid development in every direction has forced the professed student of science to devote himself to some one or more comparatively limited lines of research; and this condition of things, inevitable as it is, has some drawbacks, which are sufficiently apparent and have often been deplored. One consequence is that, while the main lines of investigation are thoroughly explored, the bye-ways and cross-cuts may often remain neglected. Herein lies the special opportunity of the amateur worker, who is bound by no restrictions, but can bring his enterprise to bear at a point where it is likely to be effective.

One other consideration I cannot omit, although I approach it not without some trepidation. Men who pass their lives in the cultivation of some branch of science, whether by practising or by teaching, are under an insidious temptation, which seems to be incident to professionalism of any kind: I mean the temptation to pay an undue respect to received doctrines, merely because they are generally received. To say so much is only to say that men of science are human, and history shows that the professional geologist has in this matter his full share of our common nature. It may be replied that there is little danger in the twentieth century of a scientific priesthood uniting to impose an orthodox creed upon the laity; and it is of course true that on many questions there is a healthy difference of opinion among professed men of science themselves. None the less the tendency of authority to override independent judgment is a possibility which we can at no time afford to disregard, and it is especially to the amateur element among scientific workers that we must look for a corrective. There are few duties more important than that of maintaining the fullest freedom of thought in all matters scientific. Better the wildest 'crank' than the authority, however eminent, who refuses to reconsider his position.

It is time to bring my rather rambling discourse to a close. If I have dwelt more on the opportunities which lie before us than on the achievements which lie behind, I trust that my remarks will not be thought inappropriate, for that reason, to the occasion on which we are met together. The end of one period is, we may hope, the beginning of another, which may be equally fruitful in results; and it rests with us, each in his degree, to make good this aspiration, handing on unimpaired to those who follow the tradition of keen interest and conscientious work which we have received from our predecessors. Many have been the changes around us in the fifty years now past, and those who live will assuredly see many changes in the

fifty years to come, but the love of Nature and the love of Knowledge are among the things which Yorkshiremen will not willingly allow to perish. Opening in this spirit the new chapter in our corporate history, we may confidently hope that, in the time to come, when a worthier President shall be called upon to deliver a Centenary Address, he will find the Yorkshire Naturalists' Union as flourishing as it is to-day, and carrying out as faithfully the objects for which it was founded.

FIELD NOTES.

MAMMALS.

Early Fox Cubs in Yorkshire.—On January 30th, Mr. F. Wilson Horsfall, Master of the Bilsdale Hounds, found a litter of foxes, which were then about ten days old. The earth was in a hedge bottom on his Potts property. About the middle of March is the usual date for the birth of fox cubs in Yorkshire.—R. FORTUNE, Harrogate, February 15th, 1912.

BIRDS.

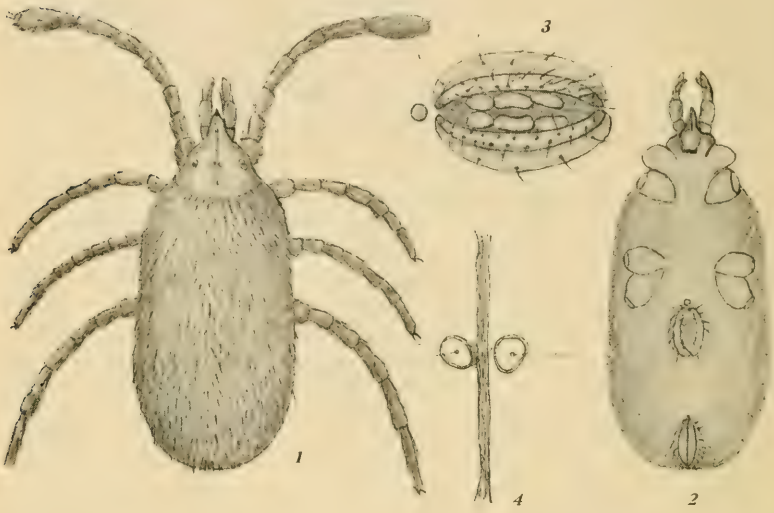
Shag at Hebden Bridge.—A shag was killed on the top dam in Nutclough Wood, Hebden Bridge, on the 24th January. Its facile diving made it a mark of attention. What it subsisted on during its stay is as puzzling as its occurrence, so far distant from its natural haunts, as there are now no fish in this water. The specimen was brought to me for inspection on the 26th. It was quite plump, and measured 29 inches from beak to tail. This is the first recorded occurrence of the species at Hebden Bridge.—WALTER GREAVES.

Bird Notes from Whitby.—This district does not usually produce the number of interesting birds observed on other portions of the county seaboard, but the gales of January, followed by the terribly severe weather experienced during the early part of February, no doubt accounts for the recent occurrence of several birds seldom noticed here. An adult female example of the little gull—a rare visitant—was picked up dead on the beach on January 22nd. On the 23rd a Fulmar Petrel was found washed up on the coast. The same day a Great Crested Grebe was found dead on the sands; on February 12th, one was shot about a mile up the river Esk, and another observed fishing in the outer harbour. Large numbers of Little Auks have also been seen dead on the shore; many have been captured, and others observed in the harbour. A female Smew was shot on the river about a mile from the sea on February 5th, which, so far as I am aware, is the first recorded occurrence of this interesting bird at Whitby. During the winter a fine immature Glaucous Gull frequented the harbour for over two months, being last seen about the middle of January.—THOS. STEPHENSON, Whitby, February 13th, 1912.

SOME BRITISH EARTHMITES.

C. F. GEORGE, M.R.C.S.,
Kirton-in-Lindsey.

OTTONIA ECHINATA.—I have not had the pleasure of seeing this pretty little mite alive. The first specimen was one sent to me by Mr. Evans, of Edinburgh, in December 1907 : it had been some time in preservative solution, and was very much bleached, giving little indication of colour, and otherwise was not in good enough condition for drawing, etc However, I made some rough figures and notes of the mite, and was there-



Ottonia echinata (1) dorsal aspect × 28 ; (2) ventral aspect × 28 ; (3) genital opening (4) crista.

fore able to recognise it, when fortunately sent to me by Mr. Musham of Selby, who found it with other mites in moss taken from Skellingthorpe Wood, South Lincolnshire, in November last. It had not been very long in preservative solution, so that its colour was not greatly altered. It was a beautiful scarlet, and must have been very handsome when alive.

This mite would seem to be widely distributed, since Scotland and Lincolnshire are so far apart. In shape, it appears to be a rather long oval, narrower in front, and wider posteriorly. The two front legs are longer and stronger than the others, and clubbed at the distal ends ; the penultimate internodes are also somewhat thickened. The fourth internode of the palpi is provided with a strong double claw ; the body is covered

with short, and rather thick colourless spines, set not very near together. The description of the mite is very like that of *Ottonia evansii*, but the crista differs from the crista of that mite, in not possessing a capitulum ; and in the difficulty of making out its commencement and termination, as will be seen by examining Mr. Soar's enlarged figure. It is unlike any other crista I have yet met with. I was unable to dissect it for want of another specimen. The eyes are situated on the dorsum of the cephalothorax on either side ; each has two ocelli. The genital aperture is not particularly remarkable, and contains the usual three copulatory discs on each side.

Nature (No. 2202) contains an excellent portrait of Sir William Ramsay, K.C.B., and a biography.

We learn from some ' Nature Notes ' that a white rabbit at Redcar takes a morning dip in the sea.

And *The Animal's Friend* gives an illustration of a tame goose that followed a man about at Bridlington. We now wait for Filey's record.

An admirable article on ' Woodland Barbarities : the ways of the Trapper and Snarer," appears in *The Animal World* for February, and is well illustrated.

In the *Geological Magazine*, No. 570, Mr. M. A. C. Hinton has an interesting paper on Fossil Shrews, and Dr. F. A. Bather writes on Upper Cretaceous Terebelloids from England.

There is an interesting paper on ' The Prehistoric Origin of the Common Fowl,' by F. J. Stubbs and A. J. Rowe, in *The Zoologist*, No. 847 ; but we fear the theories put forward will not find general acceptance.

We learn from *The [Sunderland] Library Circular* that a Sunderland Naturalists' Association has been formed, and already over 100 members have been enrolled. Miss N. March, B.Sc., is the Hon. Secretary.

Mr. J. W. Jackson favours us with a copy of his ' Further Report on the Explorations at Dog Holes,' etc. (*Trans. Lancs. and Cheshire Antiq. Soc.*, Vol. XXVIII., 1911, 25 pp.). Amongst the illustrations are some Roman bronze scales, the beam being very similar to an example found at South Ferriby.

Another ' new British Bird ' is recorded in *British Birds* for January. It is the North American Peregrine, which was shot at Humberstone on the Lincolnshire coast on September 28th, 1910. In the same journal the Editor protests against the introduction of Nuthatches and Marsh Tits into Ireland, but the protest is quite a mild one.

There is a note of interest to bibliographers in *The Entomologist*, for January, 1912. Vol. I, No. 1 of that journal was issued on November 1st, 1840 ; and No. 26, concluding the volume, in December, 1842. In 1843, and for some 20 years afterwards, the journal was merged in *The Zoologist* ; but in May, 1864, it was revived, and has since appeared monthly. The first volumes each covered two years.

The parts of *The Micrologist* before us are well illustrated, and besides containing articles on general microscopic work, include papers on ' The Polyzoa,' by H. E. Hurrell ; ' Fresh Water Algæ,' by C. Turner ; ' Protozoa,' by Abraham Flatters ; ' The Amœba,' by G. A. McKechnie, etc. The magazine is issued quarterly (1s. 6d.) by Messrs. Flatters, Milborne & McKechnie, Ltd., Manchester, and will be found exceedingly useful to the practical microscopist.

OLIGOCHAETS OF GREAT BRITAIN AND IRELAND.

Rev. HILDERIC FRIEND, F.L.S., F.R.M.S.,
Swadlincote.

Having made considerable additions to our knowledge of the British Oligochæts during the past year or two, it seems desirable to gather up the references which are scattered among the many Journals to which items have been contributed, and give a bird's eye view of the whole. No attempt had ever been made in this country to tabulate the native species of Annelids, except by myself, till 1909, when Southern published some useful notes entitled 'Contributions towards a Monograph of the British and Irish Oligochæta' (*Proc. Roy. Irish Acad.*, Vol. XXVII., p. 119, seq.). This was a valuable beginning, though it did not by any means fairly represent the subject. That list may, however, be regarded as our starting-point. It enumerates, in the author's words, '135 British species and sub-species' (I count 134), belonging (with two exceptions) to six well-known families: as follows:—

1. Æolosomatidæ	.. .. ..	6 species.
2. Naididæ	.. .. ..	24 ,,
3. Tubificidæ	.. .. ..	16 ,,
4. Lumbriculidæ	.. .. ..	5 ,,
5. Enchytræidæ	.. .. ..	52 ,,
6. Lumbricidæ	.. .. ..	29 ,,

Our following records will be in the same order, as far as possible, thereby enabling the student readily to note the additions made to our knowledge since that list was published. Southern's List stands in ordinary type, the additions being printed in italics, with such supplementary notes and references as may be found desirable to complete our knowledge.

I. Æolosomatidæ.

This is the only family which has not, so far as the writer is aware, yielded any new species or locality to the 1909 list. Six Species.

Æolosoma quaternarium Ehrb.	Æolosoma headleyi Beddard.
,, beddardi Mich.	,, variegatum Vejd.
,, hemprichi Ehrb.	,, tenebrarum Vejd.

II. Naididæ.

Two additions have been made to this family. The number has been raised thereby from 24 to 26. Many new localities have been recorded.

Paranais litoralis Müller.	Chætogaster diastrophus Gruith.
Paranais naidina Bret. ('The Naturalist,' 1911, p. 143).	,, crystallinus Vejd.
	,, diaphanus Gruith.

Chætogaster limnæi Baer.
Ophidonais serpentina Müller.
,, reckei Floer.
Branchiodrilus semperi Bourne.
Nais obtusa Gerv.
,, elinguis Müller.
,, heterochæta Benham.
Naidium luteum O. Schm. Hartshorne, in Derbyshire, October 1911.
Dero latissima Bousfield.
,, perrieri Bousfield.
Dero obtusa Udek.
,, mülleri Bousfield.
,, limosa Leidy.
,, furcata Oken.
Vejdovskyella comata Vejd.
Ripestes macrochæta Bourne.
Slavina appendiculata Udek.
Stylaria lacustris Linn.
,, lomondi Martin.
Pristina equiseta Bourne.
,, longiseta Ehrb.

III. Tubificidæ.

This large and interesting family has been the subject of much careful investigation. Tubifex has been the bugbear here, as *Lumbricus terrestris* was among earthworms. It has been very difficult to unravel the tangled skein, and much yet remains to be done. The following list is compiled from the author's paper on 'British Tubificidæ,' presented December 20th, 1911, to the Royal Microscopical Society. The descriptions of species new to science will be published in due course. Southern's List contains 16 species under five genera. It is to be regretted that much confusion has been introduced through the recently adopted method of reckoning Heterochæta, Spirosperma, and other genera as Tubifex. I revert to the old order, adopted by Beddard, not in opposition to changes wisely carried out, but because recent additions to the family convince me that the old genera will have to be retained. and possibly increased in number. In this section, therefore, I have to alter several of Southern's names; but the type will shew which records are found in his list. The number of species has been exactly doubled since 1909.

Branchiura sowerbyi Beddard.
Monopylephorus rubroniveus Lev. (=Vermiculus pilosus Goodrich).
Monopylephorus parvus Dit., 1904; 'Zeit. Wiss. Zool.', 77, 427. Kew.
Clitellio arenarius Müller.
Limnodrilus hoffmeisteri Clap.
,, udekemianus Clap.
,, parvus Southern.
,, longus Bretscher.
Limnodrilus aurostriatus Southern.
,, *aurantiacus* Friend ('The Naturalist,' 1911, No. 659, p. 414).
Limnodrilus claparedianus Ratz. Kew.
Limnodrilus papillosus Friend. First described, with the three following, in the author's paper on British Tubificidæ.—

The main features are:—Length, 25-50 mm. Segments 90 and upwards. Opaque, sluggish, orange-coloured. Setæ in front coarse, with upper tooth much longer than lower, pharynx in segments 2-3, chloragogen cells begin in 6, hearts in 8 and 9. Spermathecæ striate, no duct, short penis sheath.

Limnodrilus nervosus Friend.—Small pale worm, 10 mm. in length, about 40 segments. Chloragogen cells begin in 6, transparent and delicate. Pharynx in 2-3, hearts in 8 and 9;

setæ in segments 2-6, numbering 3 per bundle, only 2 per bundle from segment 7 backwards; teeth equal, length of setæ about one-third diameter of body. Nerve ganglia greatly enlarged in front. Near Smisby and Stretton-en-le-field, on the borders of Derbyshire and Leicestershire.

Limnodrilus trisetosus Friend.—Similar to the last. Setæ 3 throughout; in all other species the number is smaller in posterior bundles than in anterior. Lower tooth somewhat larger than upper. Chloragogen cells begin in 5. No penis sheath yet found. Mud of the Thames, Tottenham.

Limnodrilus galeritus Friend.—Setæ 4 in ventral, 5 in dorsal bundles in segments 2-7, then usually 3. Penis sheath about 15 times longer than broad. Setæ one-sixth the length of penis sheath. Characterised by the cap on the spermathecæ near the external aperture, whence the specific name. With the last in mud at Tottenham. I must refer to the R.M.S. paper for notes on some further species, such as *L. Wordsworthianus* Friend, *L. inæquidens*, etc.

Rhyacodrilus falciformis Bret. (1901 'Rev. Suisse de Zool.' IX., 205= *Ilyodrilus filiformis* Dit., 1904, 'Zeit. Wissen. Zool.,' Bd. 77, 408 = *Meganympha pachydriloides* Fr., see 'Nature,' November 16th, 1911, p. 78). Found in a little stream at (1) Netherhall, near Bretby; and (2), Netherseal, near Ashby-de-la-Zouch.

Spirosperma ferox Eisen.
Heterochæta costata Clap.
,, thompsoni Southern.
Psammoryctes barbatus Grube.
Tubifex tubifex Müller.
,, templetoni Southern.
,, *globulatus* Friend. R.M.S., December 20th, 1911.
Hemitubifex benedeni (=benedii) Udek.
Hemitubifex pustulatus Friend, 1898 ('Zoologist,' Series IV., Vol. II., 119; regarded as a variety of H. benedeni, but now held to be a new species).
Ilyodrilus (=*Tubifex*) *campanulatus* Eisen.
,, (=*Tubifex*) *bonneti* Clap.
,, (=*Monopylephorus*) *trichochaetus* Dit.
Ilyodrilus coccineus Vejd. (=Branchiura coccinea Vejd. of Southern's List).
Ilyodrilus robustus Friend.
,, *pallescens* Friend.

Details respecting Tubifex and Ilyodrilus, two of the most difficult genera at present under review will be found in the paper read December 20th, 1911, before the Royal Microscopical Society.

IV. Lumbriculidæ.

Lumbriculus variegatus Müller.
Trichodrilus (Phreatothrix) cantabrigiensis Beddard.
Stylodrilus vejdovskyi Benham.
,, gabretæ Vejd.
,, hallissyi Southern.

I leave this list untouched. A well-worm found at Mildenhall, a Trichodrilus at Shrewsbury, a Stylodrilus collected in Cumberland and Derbyshire, are as yet unrecorded. The

details take time, and it is better to delay publication, than to increase the existing confusion. Five species.

V. Enchytræidæ.

Henlea dicksoni Eisen.
,, nasuta Eisen.
,, hibernica Southern.
,, ventriculosa Udek.
,, *lampas* Eisen (See 'The Naturalist,' 1911, p. 321).
Henlea perpusilla Friend (See 'The Naturalist,' 1911, p. 320).
Henlea puteana Vejd. (See 'The Naturalist,' 1911, p. 319).
Henlea rosai Bretscher (See 'The Naturalist,' 1911, p. 320).
Henlea tenella Eisen (See 'The Zoologist,' December 1911).
Bryodrilus ehlersi Ude.
Buchholzia appendiculata Buch.
,, fallax Mich.
Marionina sphagnetorum Vejd.
,, crassa Clap.
,, semifusca Clap.
,, ebudensis Clap.

Marionina appendiculata Friend.—A brief note on this species appeared some years ago. The worm was found in backwash at Askham, near Furness. During the years which have elapsed, nothing like it has again been found, and my notes and drawings shew it to be a distinct species.

I have at least three other species under observation, which will be described in the new year.

Lumbricillus litoreus Hesse.
,, subterraneus Vejd.
,, verrucosus Clap.
,, fossarum Tauber.
,, pagenstecheri Ratz.
,, niger Southern.
,, evansi Southern.
Mesenchytræus fenestratus Eisen.
,, beumeri Mich.
,, setosus Mich.
,, celticus Southern.
Enchytræus albidus Heule.
,, globulatus Bret.
,, buchholzii Vejd.
,, argenteus Mich.
,, turicensis Bret.
,, pellucidus Friend.
,, sabulosus Southern.
,, lobatus Southern.

Enchytræus minimus Bret. (See 'The Naturalist,' 1911, p. 412.—Since found abundantly in earth by a drain at Church Gresley, and elsewhere.

Enchytræus exiguus Friend ('The Naturalist,' 1911, p. 415).—The genus Fridericia, of which 19 species were reported by Southern, now stands at 30 or more species. I give Southern's list, for the sake of completeness, first; adding the species which he omitted, and those since discovered, in italics. The subject was considered in a paper presented by me to the R.M.S., November 15th, 1911, in which keys will be found to help the student in identifying the various species. I still have a few more species to determine.

Fridericia bulbosa Rosa.
,, bisetosa Lev.
,, magna Friend.
,, aurita Issel.
,, leydigi Vejd.
,, lobifera Vejd.
Fridericia michaelseni Bret.
,, connata Bret.
,, polychæta Bret.
,, bretscheri Southern.
,, striata Lev.
,, paroniana Issel.

Fridericia glandulosa Southern.
,, agricola Moore.
,, perrieri Vejd.
,, beddardi Bret.
,, hegemon Vied.
,, valdensis Issel.
,, minuta Bret.
,, *pulchra* Friend ('The Naturalist,' 1911, p. 415).
Fridericia peruviana Friend (See 'The Naturalist,' 1911, p. 415).
Fridericia helvetica Bret.
,, *humilis* Friend.
,, *callosa* Eisen.
Fridericia aurita Issel.
,, *alba* Moore.
,, *variata* Bret.
,, *galba* Hoffm.
,, *anglica* Friend.
,, *ulmicola* Friend.
,, *microcara* Friend.
,, *parva* Moore.
,, *ratzeli* Eisen.
Achæta eiseni Vejd.
,, bohemica Vejd.
,, minima Southern.
,, *cameranoi* Cogn.

I reported many years ago to the 'Essex Naturalist' the existence of a well-worm (*Dichæta curvisetosa* Fr.). Southern, following Michaelsen, enters it in his list as *Haplotaxis gordioides* Hart. It is, however, quite a distinct species, and must, for the present, stand as *Haplotaxis curvisetosus* Friend. Another well-worm occurs in East Anglia. So far this is the only district in which they have been recorded for the British Isles. It is much to be desired that collectors should help in this department by sending any specimens they may discover to specialists for determination.

Sparganophilus tamesis Benham has not been found again. I have specimens of a worm (*Helodrilus elongatus* Friend) from Cornwall which may prove to be a Sparganophilus, but I have hitherto been unable to assign it its true position.

VI. Lumbricidæ.

Allurus tetrædrus Sav.
,, macrurus Friend.
,, tetragonurus Friend.
,, *hercynius* Mich.
Eisenia foetida Savigny.
,, rosea Sav.
,, *macedonica* Rosa.
Eisenia veneta Rosa.
,, hibernica Friend.
,, zebra Mich.
,, tepidaria Friend.
,, *dendroidea* Friend.
,, *robusta* Friend.
Allolobophora longa Ude.
,, calignosa Sav., forma turgida Eisen.
,, caliginosa Sav., forma trapezoides Duges.
Allolobophora georgia Mich.
,, *cambrica* Friend.
Helodrilus oculatus Hoffm. (= A. hermanni Mich.).
Helodrilus (Allo.) relictus ? Southern
Aporrectodea chlorotica Savigny.
,, similis Friend.
Dendrobæna subrubicunda Eisen.
,, arborea Eisen.
,, mammalis Sav. (=D. celtica Rosa.).
Dendrobæna octoedra Sav. (= D. boeckii Eisen).
Dendrobæna submontana Vejd.
,, *alpina* Rosa.
,, *merciensis* Friend.
Bimastus eiseni Lev.
,, constricta Rosa.
,, beddardi Mich.
Octolasium cyaneum Sav. (= A. studiosa Rosa).
Octolasium lacteum Oerley (= A. profuga Rosa).
Octolasium gracile Oerley.
,, *intermedium* Friend.
Lumbricus castaneus Savigny.
,, rubellus Hoffm.
,, festivus Sav. (=L. rubescens Friend).
Lumbricus papillosus Friend.
,, terrestris Linn.

Naturalist,

I have visited Cambridge, the River Thames, Chelsea, and elsewhere, but have so far failed to confirm the following:—*Allolobophora platyura* Fitz., reported by Oerley for Cambridge; *A. complanata* Dugès, said by the same writer to be found in England; *A. rubida* Oerley, recorded by Oerley for Woolwich. Oerley was a good observer, and we may yet hope to re-discover the foregoing species.

If we take the species *Eisenia veneta* Rosa, as represented by five forms (the type being at present doubtful in Britain), our list now stands thus:—

1. Æolosomatidæ ..	6	Former List	6
2. Naididæ ..	26	,,	24
3. Tubificidæ ..	32	,,	15
4. Lumbriculidæ ..	5	,,	5
5. Enchytræidæ ..	75	,,	52
6. Lumbricidæ ..	39	,,	29
7. Haplotaxidæ ..	1	,,	1
8. Glossoscolicidæ ..	2	,,	1
Total	186	,,	134; increase 52

Out of the 52 new to Britain, no fewer than 22 have been discovered and described as new to science by myself. In all, my additions to science thus far amount to 30 species. Should all be well we shall have raised the number of British species to 200, when the material now under investigation has been fully described.

Addendum.—Since the foregoing summary was written, I have determined one new species of Enchytræid, viz., *Marionina rivalis* Bret., and a new Tubificid, *Rhyacodrilus bisetosus* Friend. I also observe that Dr. J. Stephenson has added *Bothrioneurum iris*, together with two new species of Lumbricillus and two new species of Enchytræus to the British List ('Tr. Roy. Soc. Edin.', 1911, Vol. XLVIII. pp. 31-65). These bring the total up to 193. As I have not yet been able to consult Dr. Stephenson's paper, I cannot supply the names of his additions.

Mr. M. C. Dixon, a postman, and a keen entomologist, died at Spennymoor, on December 2nd, aged 37 years.

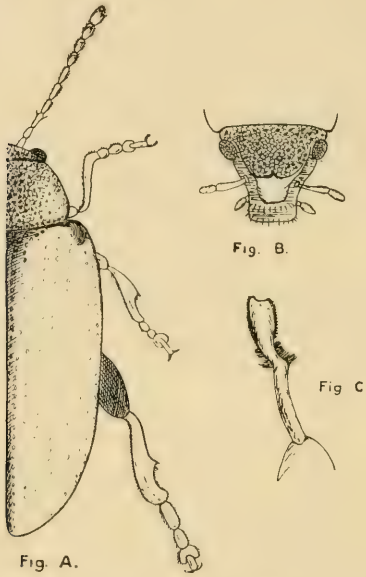
The Birstall Urban District Council is appealing for funds for the erection of a suitable memorial to Joseph Priestley, the discoverer of Oxygen. Priestley was born at Birstall.

Noticing in the 'contents' of a recent number of the Proceedings of the Cambridge Antiquarian Society that the Rev. Dr. Irving had a paper on 'A sub-fossil horse skeleton recently found near Bishop's Stortford,' we hastily turned to the page indicated. The full title of the paper, and the date it was read, are given, but, 'the rest is silence.'

A NEW BRITISH BEETLE
(*Chaetocnema conducta*).

E. CHAS. HORRELL.

In May last I gathered by general sweeping of the herbage in Forge Valley, near Scarborough, two individuals of a yellow-backed flea-beetle, which on examination proved to be quite distinct from any British species, and on reference to Redtenbacher's 'Fauna Austriaca,' it was found to agree exactly with the description of the above species. Further reference



A.—Dorsal view. B.—Head, front view. C.—Tibia. (Magnified)

to Fauconnet's 'Faune Analytique fes Coléoptères de France' and to the 'Naturgeschichte der Insecten Deutschlands,' Vol. VI., Chrysomelidae, by Weise, where there is a detailed account, confirmed me in this determination, and on submitting a specimen to Mr. Bayford and to Canon Fowler, they both agreed with my opinion.

The species at the first glance is seen to agree with the genera *Chaetocnema* and *Plectroscelis* of Fowler's 'British Coleoptera' in the emargination on the inner side of the intermediate and posterior tibiae, each edge of the emargination being raised into a tooth, and agrees with the former genus in

its large head without keel, and its large labrum, and with the latter in its regularly punctured elytra. It would appear that the introduction of this species into the British list will necessitate the dropping of the genus *Plectroscelis* and the including of our species *P. concinna* Marsh, under Chaetocnema, as is done in most modern continental works.

Chaetocnema conducta Motsch :—

Ovali-subcylindrica, sat convexa, subtus nigra, antennarum basi tibiis tarsisque testaceis, capite prothoraceque aeneo-vel aurichalceo-viridibus, illo carina faciali lata, deplanata, fronte punctata linea media laevi, hoc brevi, apicem versus parum angustato, subtilissime coriaceo, sat crebre et subtilius punctato, elytris stramineis, profunde punctato-striatis, callo humerali subprominulo limboque suturali et laterali nigris.—Long. 1.5-2.5 mm.

Motsch. Bull. Mosc. 1838.180.t.3.f.d.D. (Haltica).—Foudr. Mon. 104.—All. Mon. 278.—Kutsch. Wien. Monat. 1864, 320 (326).—Redtb. Faun. A.2.511 (Plectroscelis).—Weise, Fauna Austr. 6. 761.

Oval-cylindric, moderately convex.

Head and thorax dark metallic green, frequently with brassy reflection, elytra straw coloured, with a band at the suture, the lateral margins and the projecting shoulders black. The dark sutural band extends to the first row of punctures; and the marginal band in front extends to the outermost row of punctures; and is narrower behind the middle and is joined to the sutural band.

Antennae reddish-brownish with the last four or five joints more or less brown.

Underside black; apex of anterior and intermediate femora, all the tibiae and tarsi reddish-yellowish-brown.

Head and thorax finely shagreened, shining, forehead between the antennae wide and not keeled, moderately thickly punctured with a longitudinal band above the middle impunctate.

Thorax about twice as wide as long, with slightly rounded sides, slightly narrowed towards front, somewhat thickly and finely punctured, with punctures stronger at sides, and with a row of strong punctures at the basal margin.

Elytra somewhat wider than thorax, rounded behind, deeply punctured in rows with the interstices slightly raised, and very finely punctured; shoulders somewhat prominent. Winged.

Male with slightly widened first tarsal joint.

In Alpine regions of Switzerland, South Tirol. Rare in Austria in damp places on the margin of ditches and streams. Commoner in Spain and South France to South Russia and the Caucasus. North Africa. Syria.

YORKSHIRE NATURALISTS' UNION: VERTEBRATE SECTION.

Under the presidency of Mr. Oxley Grabham, two meetings of the verebrate section were held on Saturday, February 17th, at the Leeds Institute, and were attended by a large number of members.

The afternoon meeting was devoted to discussions, and to the examination of specimens. Mr. H. B. Booth showed, for comparison, skins of the marsh tit, and the newly claimed variety—the 'willow' tit—obtained at Bolton Abbey. Mr. Hewitt exhibited a case containing moles, one of normal colour, the other a light fawn. Mr. Butterworth showed the skins of two birds taken in the Keighley district during the recent storm, *viz.*, a Sclavonic Grebe and a Little Auk.

Discussions took place as to the appearance of so many Little Auks inland recently; and an ingenious theory was advanced by Mr. Booth, who argued that on this occasion, at any rate, it was no question of the birds being wind-driven, but that, in all probability, they mistook the snow-clad land for their own Arctic regions, and flew in search of open water, but in the wrong direction. Discussion also took place on the possibility of inter-breeding between the real Wild Cat and the domestic variety gone wild. In a letter, Mr. Claude Leatham pointed to the serious increase of Magpies in his district, and many members furnished confirmatory evidence; the infested areas being the fringes of large towns, where the holdings are small, and where the gamekeeper is not abroad. The general feeling was that it is time for the protection of Magpies to be withdrawn in the interests of other smaller birds, whose chances of rearing broods are much reduced where Magpies are present in any numbers.

Mr. John Holmes read a paper on 'Finds of Bones of Mammals in the Lothersdale Cave,' and showed some interesting geological slides in order to demonstrate that these bones had been washed into the fissure. Mr. Sidney H. Smith described a very interesting set of slides illustrating many of the gamekeeper's traps for keeping down those interesting creatures known to the shooting fraternity as 'vermin' (furred and feathered). Mr. Riley Fortune and Mr. Forrest showed some excellent slides of animal and bird life; and Mr. Jasper Atkinson had some slides of the birds of Scilly; the meeting closing with a short account by Mr. Booth of the claim of Mr. J. M. Campbell, of the Bass Rock, to the discovery of barbs pointing backwards upon the tongue of the Puffin, which probably assist (in con junction with the other barblets, noticed on the palette by Mr. C. J. King a year or two ago), in holding fish after fish, while the bird catches others.

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CORRESPONDENCE.

To the Editors of 'The Naturalist.'

In Mr. Lees' kindly review of 'Types of British Vegetation,' appearing in your January issue, there is an error which I ask your leave to correct. He refers to 'neglect to acknowledge W. B. Crump as the contributor of the six beautiful photographs making up plates 9, 13 and 25.' Mr. Crump is duly recorded as the author of these photographs both in the list of plates on p. xix. and also on the plates themselves. The reviewer has evidently been misled by the absence of Mr. Crump's name from the list of gentlemen (Preface, p. ix.) to whom acknowledgment is made for the contribution of photographs; but he has omitted to notice that these are explicitly stated to be 'other than members of the committee.' All members of the British Vegetation Committee, of which my friend Mr. Crump is a distinguished ornament, contributed all they could to the work—whether photographs or information—as a matter of course, quite apart from the actual authors of sections of the book. It would have been impossible for me, as editor, to carry through successfully a very difficult task if I had not been thus loyally and heartily supported by all my colleagues. But to gentlemen who were not members of the Committee, and who were good enough to allow their photographs to be used, special acknowledgment seemed due.—A. G. Tansley, Botany School, Cambridge.

RECENTLY DISCOVERED FUNGI IN YORKSHIRE.—V.

WITH NOTES ON NEW AND RARE SPECIES.

C. CROSSLAND,
Halifax.

THE following catalogue of Fungi newly discovered in Yorkshire demonstrates that mycological field work in our county is far from being played out, and that a continuation of this kind of work is called for.

All the 64 species included were, with two or three exceptions, found last year. Many have already been temporarily mentioned in 'The Naturalist,' but by bare name only. It will be seen that two are new to Science, and eleven new to Britain. A few others are in hand, concerning which some little doubt exists; these are awaiting fresh and more abundant material for further consideration.

This is the fifth series of additions since the publication of the 'Yorkshire Fungus Flora,' bringing the total of Yorkshire-found species to 2895 or thereabouts; in other words, 269 have been added during the intervening six years.

The words 'To precede' and 'To follow,' accompanied by a number, attached to each new record, denote the position they should occupy in the sequence of species followed in the Flora.

It is thought necessary to add a few corrections at the close concerning other species previously recorded.

NEW SPECIES.

PLUTEOLUS MULGRAVENSIS Mass. and Crossl.

Pileus somewhat fleshy, convex then expanded and umbonate, flocculose, becoming broken up into squamules, striate, grey, 5-6 cm. across; gills free, crowded, white then cinnamon, broad; stem stuffed, smooth, almost equal, base somewhat clavate, whitish, 4 cm. long; spores elliptical, ochraceous-brown, 9-10 × 4-5 μ.

N.E.—On wood, Mulgrave Woods. (F.F., Sep. 1911, 'Nat.', Nov., pp. 387-393). [To follow 394].

Structurally *Pluteolus* agrees with *Pluteus*, differing in having brown instead of pink spores. *P. mulgravensis* differs from the two previously known European species, *P. reticulatus* and *P. aleuriatus*, in the umbonate, striate cap becoming squamulose, and in the larger spores. The last-named species was also collected during the Foray.

Pileus carnosulus e convexo expanso umbonatus flocculosus, dein squamuloso-diffractus, striatus, griseus, 5-6 cm. latus. Lamellæ liberæ, confertæ, ex albo cinnamomeæ latæ. Stipes farctus, glaber, subæqualis, basi subclavata, albidus, 4 cm. longus, 3 mm. crassus. Sporæ ellipsoideæ, ochraceo-brunneæ, 9-10 × 5-6 μ.

Mr. A. D. Cotton, Kew, sends the following particulars of a new species for insertion in these notes:—

Clavaria crosslandii Cotton, sp. nov.

'*Plants small, unbranched, isolated or fasciculate, greyish-white or grey, becoming darker with age; smell and taste slight, pleasant. Clubs very slender, brittle, 2-3 cm. high, 1-3 mm. thick, pruinose, cylindrical, apex usually pointed. Stem hardly distinct. Flesh somewhat darker than hymenium. Internal structure pseudoparenchymatous in transverse section, cells 5-8 μ diam. Basidia 20-25×4-5 μ, contents granular, sterigmata 4, erect. Spores hyaline smooth, pip-shaped, 4-5×2.5-3 μ.*'

Hab.—In short grass. Mulgrave Woods. (F.F., Sep. 1910 and 1911), 'Comm. C. Crossland and W. N. Cheesman.' [To precede 1238].

'The grey colour and small size, which cannot fail to strike the observer, are good field characters by which to recognise the present species. From the drab-coloured *C. tenuipes*, it is distinguished by its slender, brittle clubs, and from *C. fumosa* by its fasciculate instead of densely tufted habit. *C. acuta*, which the new species resembles in size, habit, and texture, differs in the complete absence of the grey tinge. The microscopic characters confirm its title to specific distinction, the small basidia and spores marking it off from allied species.'

'Amongst continental species *C. crosslandii* most nearly approaches *C. affinis* Pat. et Doas., but this plant differs, according to the published description (no type is preserved), (1) in the distinct stem; (2) in becoming yellow on drying; and (3) in the slightly larger, punctulate spores. Though, on both occasions, a few clubs only were met with, the specimens agreed precisely, and were sufficient to show the essential characters. It is a pleasure to name the plant after Mr. Charles Crossland, not only because of his keen interest in the genus *Clavaria*, but on account of his services to British Mycology in general.'

'*Plantæ simplices, minutæ, sparsæ, v. fasciculatæ, pallidæ v. cinereæ. Clavuli graciles, 2-3 cm. alt., 2-3 mm. cras., pruinosi, cylindracei, apice acute. Basidia minuta, 20-25×4-5 μ; sporis hyalinis, levibus minutis 4-5×2.5-3 μ. Hab. ad terram graminosum.*'

NEW TO BRITAIN.

Lepiota medioflava Boud. 'Bull. Soc. Myc. Fr.' Tome X., p. 59, pl. 1 (1894), fig. 1.

M. Boudier remarks:—'This rather slender species resembles others of the genus, but may be distinguished by its white colour, pale yellow umbo, striate, finely tomentose pileus, ovate uniguttulate spores: smaller than those of *L. cepæstipes*, to which it comes near. This species has been found several times in France, both in greenhouses and in the open.'

S.W.—On decaying cocoa-nut fibre and soil in greenhouse, Hebden Bridge. James Needham. Oct. 1911. [To follow 69].

'*Pileus expanded, 2-3 cm. across, striate, snow-white, excepting the prominent, yellowish umbo. depressed around the umbo, minutely silky-tomentose ; gills free, white ; stem 4-6 cm. long, fistulose, minutely scurfy above median, reflexed ring, finely tomentose below, base thickened and yellowish ; spores* 5-6 × 3 *μ.*'

Collybia phaeopodia Fr.

N.E.—On bare soil in nettle-bed, garden corner, Sandsend. (F.F., 1911, 'Nat.', Nov., p. 392). [To follow 179].

'*Pileus expanded, even, glabrous, moist, umbo evanescent, flesh brownish ; gills white ; stem blackish-brown, thickened at both ends.*' ('Mass. Eur. Agar.', p. 49).

Pluteus sororiata Karst.

N.E.—On rotting branch, Mulgrave Woods. (F.F., 1911, 'Nat.', Nov., p. 392). [To follow 322].

'*Pileus campanulate, expanded, floccosely scaly, yellow ; gills flesh colour ; stem pallid, then yellowish ; spores* 7-8 × 6 *μ.*'

Flammula carnosa Mass.

N.E.—Growing in small fascicles on wood, found by Mr. A. Clarke at the Castle Howard F.F., Sep. 1909. For description and remarks see Massee's recently published 'British Fungi,' p. 290.

Hypholoma aelopodium Fr.

N.E.—On rotting stump, Mulgrave Woods. (F.F., 1911, 'Nat.', Nov., p. 392). [To precede 658].

'*Pileus fleshy, convex, then plane, obtuse, glabrous, subrufescent ; gills adnate, yellowish, then brownish-olive ; stem fistulose with a free tube inside, variegated with minute red squamules.*' ('Mass. Eur. Agar.', p. 213).

Polyporus tephroleucus Berk.

S.W.—On decaying, prostrate trunk, High Greenwood, near Hebden Bridge. Aug. 1911. James Needham.

Pileus dimidiate, white, slightly zoned, not distinctly velvety nor yet smooth, rigid, coriaceous, 9 cm. wide, 5 cm. back to front ; flesh white, 4-6 mm. thick ; pores greyish, oblique, 4-5 mm. long ; mouths slightly irregular in size and shape, 4-5 = 1 mm., dissepiments very thin ; spores allantoid, or nearly straight, 4-5 × 1.5 μ.'

The above description was taken from the Hebden Bridge specimens while in a fresh condition by the writer.

Poria rancida Bresadola. 'Fungi Trident.' II., p. 96.

N.E.—On the ground among decaying pine needles, Mulgrave Woods. (F.F., 1910).

Effusa, alba, dein pallida alutacea, margine subfimbriata, denum secedente ; subiculum tenue, submembranaceum ; tubuli 2-4 mm. longi, pori varii, rotundati, oblongi, subangulati, mediocres vel submajusenti, usque ad 1 mm. lati, ore integro vel

demum etiam lacerato, substantia coriacea, odore forti, farinaceo rancido praedita; sporæ hyalinæ, cylindraceo, subcurvulæ 5-7 × 2·5-3μ; basida clavata 15-16×4-6μ; hyphæ tenues, 2·5-4μ crassæ.

Sent a specimen to C. G. Lloyd, Oct. 1910, who remarks:—'*Poria rancida* Bres. I have collected this same species in France on pine needles, and it was confirmed by Bresadola.'

Peniophora aurantiaca.

N.E.—On decaying wood, Mulgrave Woods. (F.F., 1911. Not included in 'Nat.', Nov. 1911 list, p. 393). [To follow 1180].

'Very like *P. incarnata* in habit and colouring, but differs chiefly in ite larger, broadly illiptical spores and larger basida.' (Elsie M. Wakefield).

Uromyces loti Blytt.

N.E.—On *Lotus corniculatus*. Raincliffe, Scarborough. T. B. Roe, Aug. 1911. (Jour. Botany, Vol. XLIX. (1911), p. 367).

Nummularia discreta (Schwein) Tul.

N.E.—On apple, near Sandsend. (F.F., 1910). [To follow 1484].

Monilia sitophila (Mont.). 'Sacc. Syll,', IV., 35.

S.W.—On steamed oatmeal, prepared for dog-food, Doncaster. Aug. 1911. ('Comm. Mr. M. H. Stiles'). [To come near 2302].

'*Tufts effused, of a pleasant rosy-orange colour; mycelium creeping; conidiophores ascending, 120-130×12 μ, sparingly constricto-septate, twice dichotomous above; branches and branchlets thick, crowdedly septate and easily separating at the septa; conidia apical, shortly concatenate, globose, 10-12 μ diam.*'

'Hab. on rotting bread-crumbs, and on wheat-spikes, Paris and Lyons, France.'

Mr. W. B. Grove, to whom the specimen was submitted, kindly supplied me with the foregoing description and note.

NEW TO YORKSHIRE.

The following 36 species were all found in Mulgrave Woods during the Spring and Autumn Forays of last year, and are included in the bald list of Mulgrave additions printed on pp. 392-3, 'Nat.', Nov. '11. All V.C., N.E. This general heading is intended to save needless repetition. After these, the Vice-Counties are added as usual.

Amanita puella.

'This fungus is by some considered as a variety of *Amanita muscaria*, from which it differs very materially in the behaviour of the universal veil, which in *A. muscaria* adheres very closely to the cap and is carried up by it under the form of white

patches, and there is practically no free portion left as a volva; whereas in *A. puella* the cap does not carry up the universal veil, which consequently remains as a good volva. The fungus is also much smaller and more slender than *A. muscaria*.' ('Mass. Brit. Fungi,' 1911, p. 83). [To follow 45].

Tricholoma hordum Fr.
Under beech and other trees. [To follow 105].

Tricholoma patulum Fr.
Among decaying pine needles. [To follow 121].

Tricholoma civile Fr.
Among fallen pine needles. [To precede 127].

Tricholoma duracinum Cooke.
On the ground. [To precede 127, after *T. civile*].

Tricholoma lixivium Fr.
Among decaying leaves. [To follow 137].

Mycena paupercula Berk.
On decaying log. [To follow 233].

Pleurotus porrigens (Pers.).
On decaying piece of pine branch. [To follow 310].

Pluteolus aleuriatus Fr.
On rotting sticks. [To follow 394].

Inocybe deglubens Fr.
On the ground among pine leaves. [To precede 441].

Inocybe perlata Cooke.
On bare ground under beech. [To precede 442].

Flammula liquiritiæ (Pers.).
On fallen fir-branch. [To follow 478].

Cortinarius (Phleg.) turbinatus Fr.
On the ground under beech. [To precede 548].

Cortinarius (Phleg.) emollitus Fr.
Among grass near beech tree. [To follow 552].

Cortinarius (Ino.) turgidus Fr.
On the ground. [To follow 560].

Cortinarius (Tela.) stemmatus Fr.
On moist ground, stream side. [To follow 604].

Hygrophorus fuscoalbus Lasch.
Among grass, woodland path side. [To follow 773].

Russula virginea Cke. and Mass.
Among short grass. [To precede 855].

Russula pectinata Fr.
Among decaying leaves.

Polyporus albidus.
On fir wood. [To be listed near 1038].

First found in Britain by the writer, and Thos. Hey, Derby,

on tree trunk near Grindleford railway station, Derbyshire. 'Trs. Brit. Myc. Soc.' Vol., III., pt. 3, p. 230.

PORIA COLLABEFACTA B. and Br.

On fallen decaying branch. [To come between 1075 and 1076].

HYDNUM SEPULTUM B. and Br.

On the sawn end of a branch laid on the ground, during the Spring Foray. [To precede 1118].

HYDNUM UDUM Fr.

On decaying branch. (Not included in 'Nat.', Nov. '11, list, p. 393). [To precede 1118, after *sepultum*].

GRANDINIA MUCIDA Fr.

On rotting wood. [To follow 1137].

CORTICIUM FOETIDUM B. and Br.

On rotting wood during tne Spring Foray. [To follow 1158].

ALDRIDGEA CAESIA (Pers.) Mass. (= *Thelephora caesia* Pers., *Soppittiella caesia* Mass.).

Spreading over moss, decaying twigs, etc. [To follow 1208].

MELAMPSORA ALLII-SALICIS-ALBÆ.

On *Salix alba*. [To precede 1285].

UROMYCES DACTYLIDIS Otth.

On *Dactylis glomerata*. [To precede 1306].

SYNCHYTRIUM SOLANI.

On rotting potato stems. [To follow 2198].

ASCOCHYTA PISI.

On living pea-pods in garden, Sandsend. [To follow 2253].

RHINOTRICHUM DECOLORANS Cooke.

On chips, during the Spring Foray. [To precede 2328].

RHINOTRICHUM RAMOSISSIMUM B. and C.

On decaying paling, during the Spring Foray. [To precede 2329].

SPICARIA ELEGANS Harz.

On decaying paling. [To precede 2349].

PERICONIA ALTERNATA (Berk.) Sacc.

On decaying herbaceous stem. [To follow 2383].

CERCOSPORA APII Fresen.

On living celery-leaves, garden, Sandsend. [To follow 2417].

ARCYRIA POMIFORMIS Rost.

On rotting wood. [To follow 2523]. According to 'Lister's Synopsis,' 1907, p. 19, there is sufficient ground for separating this from *A. albida* = *A. cinerea*.

LEPIOTA NIGROMARGINATA, 'Mass. Eur. Fung. Flo.', p. 10. N.E.—Among grass, Scarborough, 1885. Then new to

Britain. 'Journ. Bot.', XLI. (1893), p. 385; 'Tr. Brit. Myc. Soc.', 1904, pp. 61-2; [To follow 66. Previously overlooked].

Cortinarius (Hygr.) privignus Fr.

S.W.—On the ground, High Greenwood, Hebden Bridge. Sep. 1911, J. Needham. [To follow 609].

Coprinus tardus Karst.

S.W.—Hewenden Wood, near Cullingworth. Thos. Hebden, Oct. 1911. [To precede 736].

Polyporus trabeus Rostk.

S.E.—On pine log, Osgodby Wood. Sep. 1907, W. N. Cheesman, certe, C. G. Lloyd, Feb. 1908. Accidentally overlooked when compiling previous additions. [To precede 1039].

Melampsora pyrolæ (Gmelin).

N.E.—On leaves of *Pyrola minor*. Silpha Moor, near Scarborough. T. B. Roe, June 1911. [To follow 1293].

Uromyces scrophulariæ (DC.).

S.E.—Teleutospores on *Scrophularia aquatica*. Driffield. July 1911. R. H. Philip. [To follow 1312].

Uromyces ambiguus Lêv. No Æcidium known.

Mid.W.—On *Allium Scorodoprasum*. Ripon. July 1911, communicated by W. West to W. B. Grove, Birmingham University. Only recently recorded for Britain, from Clare Island. There is a bit in the late Dr. Plowright's herbarium now at the above University, gathered by Rev. J. E. Vize, without date or locality. [To come near the end of Uromyces].

Puccinia festucæ Plow., 'Gard. Chron.', 8, 1890, p. 42.

N.E.—Æcidium stage on *Lonicera Periclymenum* = *A. periclymeni* Schum (Yorks. F. Flo., No. 1398). Staintondale, near Scarborough. May 1911, T. B. Roe. [To follow 1347].

The establishment of the connection between the *Æcidium* on honeysuckle, and the *Puccinia* on *Festuca*, by Dr. Plowright, in 1890, was accidently overlooked when the Y. F. Flo. was compiled.

Humaria nicholsoni Mass.

S.W.—On stack of rotting leaves. Victoria Park, Keighley. Aug. 1911, Thos. Hebden. [To follow 1807]. Only previously recorded for Kew Gardens.

Darluca filum Cast.

N.E.—Parasitic on the sori of *Puccinia calthæ*. Throxenby Mere, near Scarborough. T. B. Roe, July 1911. [To follow 2266]. The *Darluca* was detected by W. B. Grove, to whom a bundle of diseased *Caltha* leaves were sent.

Stachybotrys lobulata Berk.

S.W.—In great abundance, on damp wallpaper. Mixenden Hall (unoccupied), near Halifax. July 1911. [To follow 2379].

Mr. Grove thinks it very likely that *Stachybotrys lobulata* is the conidial form of *Chætomium chartarum*.

Hormodendron chartarum (= *Haplographium chartarum* (Cooke) Sacc = *Penicillium chartarum* Cooke).

S.W.—On damp wallpaper. Birks Hall (partly occupied), near Halifax. May 1911. [To follow 2391].

Sporodesmium chartarum B. and C.

S.W.—On damp wallpaper. Birks Hall, near Halifax. In company with *Stemphylium alternariae*. [To follow 2422]. Some authors consider *S. chartarum* to be but a form of *S. alternariae*

Graphium griseum (Berk.) Sacc.

S.W.—On damp decaying herbaceous stem, in hedge bottom. Luddenden, near Halifax. Oct. 1911, H. Walsh. To precede 2455].

CORRECTIONS.

Inocybe adequata.' Nat.', Dec. 1892. No. 254, Y.F.Flo.

This name must be substituted by *Inocybe mimica* Mass· 'Mon. Genus Inocybe, Anns. Bot., July 1904, p. 492.'

'This fungus was collected in two separate localities at Castle Howard during the Fungus Foray, Sep. 1892' (1902 in the above Monograph should be 1892). 'It was at the time referred to *Inocybe adequata* Britz., by Dr. Cooke; it differs, however, very materially from that species. The pileus exactly mimics that of *Lepiota friesii*, as figured in Cookes' Illustrations, pl. 941, hence the specific name.'

[To come between Nos. 433 and 435, Y.F.Flo.

Polyporus umbellatus. Y.F.Flo. No. 1015.

This name must be deleted, the species having since been proved to be *P. frondosus*, No. 1016. Mr. Thos. Hebden found fine specimens at the same place, and under similar conditions, Oct. 1911.

For *Puccinia dispora*, No. 1332, Y.F.Flo., read *Puccinia dispersa*.

For *Poria collebofacta*, 'Nat.', Nov. '11, p. 393, read *Poria collabefacta*.

In the preliminary list of additions in 'Nat.', Nov. '11, pp. 392-3, delete *Mycena strobilina* and var. *coccinea*; also delete † in front of *C.* (*Phleg.*) *infractus*, *Hygrophorus nemoreus*, *Poria vitrea*, *Clavaria tenuipes*, misprinted *tenuispora*. These are not new to Yorkshire, though additions to the Mulgrave Flora.

By unwarily following the Excursion Programme for 1911, I was led into the error of quoting Ingleton as being in Vice County N.W. ('Nat.', p. 326), whereas Ingleton, Ingleborough, and Kingsdale lie in the north-west corner of V.C. Mid. W.

In Memoriam.

SAMUEL JAMES CAPPER.

For more than forty years probably no north of England entomologist has been better known or more highly esteemed than Mr. Samuel James Capper, of Huyton, Liverpool, whose death, at the patriarchal age of nearly eighty-seven years, took place on the 21st of January last.

Born at Highbury Place, London, on April 28th, 1825, he was, when twelve years old, sent to a 'Friend's' School at Epping, where, as is so often the case at schools of the Society of Friends, the boys were encouraged in the pursuit of natural history, and where young Capper made the acquaintance of the brothers Edward and Henry Doubleday, who helped him considerably in the study of the lepidoptera, which he had commenced. After leaving school he had little time for Natural History work, until he removed to Liverpool, about the year 1846; but soon after this he made the acquaintance of the brothers Nicholas and Benjamin Cooke, C. S. Gregson, Noah Greening, and other well-known lepidopterists of the time, and with whom, in the intervals of a very busy life, he made frequent excursions in pursuit of lepidoptera to various noted localities, their favourite one in their own district being Delamere Forest. Later, Mr. Capper became very fond of the New Forest; and still later, of North Wales. It was on one of his visits to the last-mentioned district, that he re-discovered the pretty *Acidalia contiguaria*, for, although the species had been first recorded as British by Mr. Weaver in 1855, and a casual specimen had been taken later by Mr. G. H. Kenrick of Birmingham, little was known of it until Mr. Capper found it to be fairly common on the mountains at Penmænmawr, which district still remains its only known British habitat. It was on one of his expeditions on these Welsh mountains that he unfortunately slipped and injured one of his legs, from which he was slightly lame for the rest of his life, and this probably stopped his outdoor collecting much earlier than would otherwise have been the case.

He was always intensely interested in the Lancashire and Cheshire Entomological Society, of which, at the preliminary meeting which founded the Society, held at the residence of Mr. Nicholas Cooke, he was chosen the first President, an honour which was re-conferred upon him year by year from 1877 until the present year, a period of forty-five years.

He was never more happy than when he had a number of entomological friends at his house, looking over his fine collection, and 'talking entomology'; and those of us who were privileged to join in the delightful entomological garden parties

he used to give at Huyton Park, thirty or more years ago, well remember what a charming host he made.

For some years he was a Fellow of the Linnean Society, and had been a Fellow of the Entomological Society of London since 1890.

In business he was for many years a partner in the well-known Liverpool firm of Homœopathic Chemists, Messrs. Thompson and Capper, but he ceased to take an active part in it about fifteen years ago. He was indeed one of the first promoters of Homœopathy in Liverpool, and it was greatly owing to his efforts that the Hahnemann Hospital was built, of which he was Honorary Secretary for fifty-seven years.

His remains were cremated at the Anfield Crematorium, and at the funeral service, the large company of relatives and friends assembled, included members of the Entomological Society of London, and of the Lancashire and Cheshire Entomological Society.

He left four sons and four daughters. One of the latter, herself an ardent naturalist, married Dr. H. H. Corbett, of Doncaster, who has for many years been a prominent member of the Yorkshire Naturalists' Union, and at the present time is President of its Entomological Section.—G. T. P.

——: o : ——

Mineralogy, by **F. H. Hatch, Ph.D., F.G.S.,** etc. Fourth Edition. pp. x.+253, 1912. London: Whittaker & Co. 4/- net.

The fact that this handy text-book has now reached its fourth edition speaks well for its popularity. The present edition has been entirely re-written and enlarged, and is illustrated by 124 diagrams and blocks from photographs. The lists of localities in which the various minerals occur seem to have been most carefully compiled.

Photomicrographs of Botanical Studies. Published by Flatters, Melborne & McKechnie, Ltd., Manchester. 62 pp., 2/- net., N.D.

This is a little volume of 103 photomicrographs which the authors claim "covers practically the whole range of study requisite for the Botanical Student.' This may be a matter of opinion; but certainly the photographs on the whole are of a high order, and include many sections which will be both useful and interesting to the student. The subjects include Algæ, Fungi, Liverworts, Ferns, Horsetails, Club Mosses, Pine, and Flowering Plants. It is a pity to find, however, that the labelling of the parts has been done in a misleading and inaccurate way. To give a few examples of misapplied names, the sections of thistle leaf, wheat stem, and 'Berbery' leaf, are said to be attacked by uredospores, teleutospores and 'aecidiospores' respectively, of *Puccinia graminis*, which gives a fundamentally wrong idea of the life-cycle of this parasite. The steles of Selaginella are called 'vascular bundles.' Section 30 might pass for that of a stem, but not a 'root of bean.' A pine seed is described as a 'mature ovule,' and what is called a 'L. S. Embryo sac' of wheat is misleading in almost every detail. The fruit coat of *Triticum sativum* is marked 'pericarp of seed,' while the fruit of *Alexanders* is so labelled as to suggest that a mericarp is a seed. It is also disappointing to find that in only two cases is the magnification given.

YORKSHIRE BRYOLOGISTS AT KNARESBOROUGH.

The bryologists of the Yorkshire Naturalists' Union held their first sectional meeting at Knaresbro' on January 27th. The grounds of the castle were visited first to see *Barbula gracilis*, this being where the first Yorkshire specimens were obtained. The snow spoilt the general facies of the plant, but it was found; then the river was crossed and the rocks and cliffs examined. The moss flora of these cliffs is interesting, on the tufa which occurs wherever the rocks have water running over them, *Weisia verticillata* is the dominant moss, with *Weisia calcarea* near at hand, but keeping to where the rock is more marly; great patches of *Cephalus conicus* spread over both at times, the condition necessary appearing to be damp below, but not such a run of calcareous water. Mr. R. Barnes mentioned how the mosses had changed during his observations, *W. calcarea* being supplanted in great measure by *W. verticillata*. This latter moss is stated in the text books to be a very rare fruiter, but the opinion of the Yorkshire experts here disproved this as far as our county is concerned. Where the rocks are more purely limestone *Eurhynchium tenellum*, the delicate little *Fissidens pusillus*, and *Jungermania pumila* are found. On loose blocks of limestone at the base of these cliffs *Eurhynchium murale*, the curious *Barbula sinuosa* and *Plagiothecium depressum* occur. Further along on the river side below the weir masses of *Lunularia cruciata* afforded a subject for discussion in regard to its claims for inclusion as a native, the plant seems thoroughly established here as at a great many other localities, but older records are not sufficiently corroborative, and its constant appearance in greenhouses, together with the easy way it is distributed by means of gemmæ, are evidence against its acceptance. Mr. W. Ingham pointed out the var. *julaceum* of *Eurhynchium murale*; and *Barbula revoluta* and *lurida* were gathered.

Passing along beyond the dropping well search was made for *Amblystegium sprucei*, but unsuccessfully, Mr. Barnes had previously gathered it on these rocks. The path was followed along the river side towards Grimbald's Crag, and on getting into the fields, *Thuidium recognitum* was seen, and further along, good patches of *B. sinuosa* and *P. depressum* claimed attention, and the little candle snuffer calyptras of *Encalypta vulgaris* were seen emerging from the snow covering.

On Grimbald's Crag *Potentilla verna* was in flower. This had been found a fortnight earlier, together with flowers of *Potentilla fragariastrum* and *Geranium robertianum* by Miss M. Mellish. In the quarry beyond the crag, *Thuidium hystricosum* was obtained, and *Tortula rigida*.

The road was taken back to Knaresbro', and after tea Mr. Ingham showed a fine series of forms of *Hypnum cuspidatum*, and gave a delightful discourse on the same, the variation of the plant in colour and form being pointed out in the various habitats, and some suggestions made to account for the changes. Next Mr. Barnes showed an excellent drawing of *Phascum cuspidatum*, and also a series of photographs of some other of his wonderful microscopic preparations of moss peristomes, etc. The party was most enthusiastic, the general feeling being that could the series of Mr. Barne's slides be photographed for minute detail, and drawings of the whole plants be made as the specimen shown, then indeed the Millennium would be reached for the bryologists whose pockets could stand the strain. The drawings and photomicros were done by friends of Mr. Barnes.

Mr. A. Wilson then read a paper on the collection and preparation of specimens of mosses, and gave details of his methods. This paper will be of lasting help to those who have not worked long at the subject, and at the same time emphasize the need for care in labelling specimens at once to obviate future mistakes as to localities and other data. This concluded the business. A further meeting was decided on, to be held on March 16th, at Pateley Bridge, the train being due there at 9-50 a.m. The gills will be worked, and at Harrogate tea will be arranged, after which it is suggested that microscopes should be provided in order to examine Mr. Barnes' slides; and, if possible, some papers will be read.—C. A. CHEETHAM.

PROCEEDINGS OF PROVINCIAL SCIENTIFIC SOCIETIES.

Early this year we received a pamphlet—the **Transactions of the Manchester Geological and Mining Society,** Vol. XXXII., parts VII., VIII., and IX., and dated M.D.C.C.C.C.X.I. As it contains some 40 pages only, and plates, we cannot see the necessity for the cumbersome 'parts VII., VIII. and IX.'; besides being inaccurate.

Part 1 of Vol. XXIII. of the **Proceedings of the Geologists' Association** is occupied by a paper on the geology of the Bergen district, by Dr. C. F. Koldirup and Mr. H. W. Monckton. Some of the illustrations of modern glacial phenomena are interesting; that of a section in the moraine at Moströmmen might be exactly matched in the Holderness glacial gravels.

The Annual Report of the Manchester Museum for 1910-11 (50 pp., 6d.) contains a reference to the fact that an extension has been commenced for the adequate housing of the Egyptian and Anthropological Collections, which will give much-needed relief to the over-crowded natural history collections. Judging by the Report the staff have been by no means idle during the past year, and much good work has been done.

We have received Parts III., IV., and V. of **Marvels of the Universe,** which is appearing in fortnightly parts (7d. each: Messrs. Hutchinson & Co.). They contain a remarkably fine set of photographs and photo-micrographs, which are described by such well-known writers as Lord Avebury, R. Lydekker, W. P. Pycraft, Sir Harry Johnston, etc. Amongst the subjects dealt with in the parts before us are sacred beetles, luminous fungi, bower birds, coffer-fishes, flexible sandstone, Pelorus Jack, wasps, moles, moths, snow crystals, Saturn, sea-cucumbers, whales, flies, fossil weather, tortoises, etc. There are some excellent coloured plates in each part.

Proceedings of the Liverpool Geological Society, 1910-11, Vol. XI. part 2, pp. 59-152. Edited by **J. H. Milton, F.G.S.** This society and its editor are to be congratulated upon the fact that its volume contains many valuable papers, and all of distinct local interest. Mr. W. Hewitt makes a good start in giving a list of the papers bearing on the district, published between 1890 and 1909. He then deals with the conditions under which the local Triassic Rocks were formed; as his Presidential Address to the society. Mr. H. C. Beasley continues his useful work on the Storeton footprints, and Mr. F. T. Maidwell has also a contribution on Keuper footprints. Messrs. C. B. Travis and W. H. Greenwood give elaborate tables, etc., of the mineralogical and chemical constituents of the Triassic Rocks of the Wirral. There is also a list of the geological maps in the society's possession. There can be no doubt that the place to look for papers on the geology of the Liverpool district is in the Liverpool Geological Society's Transactions, which is as it should be.

Vol. XXV. of **The Proceedings and Transactions of the Liverpool Biological Society** for the Session 1910-11 (304 pp.) is, as usual, full of valuable matter. After a brief abstract of Mr. R. Newstead's Presidential Address on The Natural History of the Maltese Islands, is Dr. W. A. Herdman's ever-welcome Report on the work of the Liverpool Marine Biological Committee and their Station at Port Erin; Mr. W. Riddell describes the Polychaeta of the Port Erin District; Mr. A. O. Walker has Notes on *Jassa falcata*; and then follows the Report on the Investigations carried on during 1910 in connection with the Lancashire Sea-fishes Laboratory at the University of Liverpool, and the Sea-fish Hatchery at Piel, near Barrow. This occupies over 200 pages, and deals with internal parasites and the diseases of fishes, etc.; the Sporozoan in the Whelk; Hydrographic Observations; Plankton; Plaice Measurements and Plaice Marking Experiments. This excellent report is prepared by Prof. Herdman, with the assistance of Messrs. Andrew Scott and James Johnstone. There are several plates and diagrams.

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NOTES AND COMMENTS.

SOME SCIENTIFIC SERIALS.

The number of serial publications now being issued, bearing upon natural science in one form or another, is distinctly encouraging and, generally speaking, whether dealing with the subject from a popular or technical standpoint, they are nowadays of a very high standard. When, a few years ago, the revival of nature study took place, the market was flooded with so-called natural history publications. Many have 'gone to the wall,' or elsewhere. The best have lived.

THE NATURE BOOK.

From Messrs. Cassell we have received part 1 of a re-issue of 'The Nature Book,' which we had the pleasure of referring to when originally published some little time ago. It will be completed in thirty-six fortnightly parts, at sevenpence each. It is attractively printed on good paper, and illustrated by a profusion of blocks from photographs representing flowers, trees, birds, mammals, clouds, etc., etc. Amongst the contributors we notice such well-known names as Kearton, English, Irving, Duncan, Ward and Bastin. There are also some charming monochrome and coloured plates, the latter being mounted on tinted paper.

BRITISH BIRDS' NESTS.

From the same house is part 1 of 'British Birds' Nests: how, where and when to find and identify them,' which is also appearing in sevenpenny fortnightly parts, but will be completed in seventeen parts. It is the work of the brothers Kearton, and usually each species is dealt with under the heads of 'Description of parent birds,' 'situation and locality,' 'materials,' 'eggs,' 'time,' and 'remarks.' The word 'time' does not refer to the punishment likely to fall to the lot of the over enthusiastic collector, and we hardly think the object of the work is to encourage collecting eggs or birds, though probably a statement on the point will be made as it proceeds. In addition to the reproductions of photographs in the text, the part before us has two excellent plates in colours, 'reproduced direct from Nature,' one shewing a linnet's nest, and the other, eggs of crows, ravens, jays, etc.

BRITISH MAMMALS.

Messrs. Gurney and Jackson have issued part 10 of Major Barrett-Hamilton's magnificent 'History of British Mammals,' a work which has long been wanted, and cannot be superceded. The part before us is devoted to the rabbit or cony, and in addition to the most complete of descriptions of the species, its anatomical and other peculiarities, has a number of excellent illustrations, not only of the animals themselves, but of their

burrows, simple and complicated. One of these we are kindly permitted to reproduce (plate VI). In common with many of our readers, we are all impatient to see this fine work completed.

LAND AND FRESHWATER MOLLUSCA.

We are also pleased to announce the appearance of part 19 of another substantial contribution to British natural history, viz., the 'Monograph of the Land and Freshwater Mollusca of the British Isles,' by the President of the Yorkshire Naturalists' Union, Mr. J. W. Taylor. The part is devoted

Helix pisana **on its food plant, at Tenby.**

to a thorough description of the characters, varieties and distribution of *Helix pisana* (a species which is not recorded for the northern counties), and *Helicigona lapicida*. These are illustrated by distribution maps, photographs of habitats, monstrosities, and varieties, and also by some really wonderful coloured plates. We believe we are correct in stating that these could only have been drawn and reproduced by Mr. Taylor. Through the kindness of the author we are able to reproduce one of them (plate I).

'SCIENTIFIC' NAMES.

We have many times called attention to certain absurdities in nomenclature, but we think the height of absurdity has been reached in a volume of the Transactions of the American Entomological Society, attention to which is drawn by Mr. Meyrick, in *The Entomologist's Monthly Magazine*, No. 573. We quite agree that the names are 'based on a barbarous and unmeaning gibberish,' and that 'if a name is without

meaning, and only consists of a chance arrangement of letters, memory, deprived of the clue afforded by sense, is unable to recall the name with accuracy, . . . hence on every occasion reference would have to be made to the original authority for verification, an intolerable burden and a great hindrance to scientific work.' One series of insects was named *tana, vana, wana, zana,* etc. ; another *fandana, gandana, kandana, landana,* etc. ; another, *hohana, kokana, lolana, momana, nonana, popana,* etc. And so on. Mr. Meyrick adds, ' a line must be drawn somewhere, and for my part I draw it here and now. I refuse to accept these names, and shall quote them as synonyms with the syllable (*van.*) attached, signifying that they are void. I take the responsibility of re-naming the species accordingly, since someone must do it.' And Mr. Meyrick does.

EUROPEAN BIOLOGICAL STATIONS.

In the Transactions of the Wisconsin Academy of Sciences (Vol. XVI., part 2, No. 5) Mr. C. Juday gives an account of ' Some European Biological Stations,' with illustrations. From his description, and from the pictures, it is apparent that England is hopelessly behind its continental friends in the matter of Biological Stations. The author gives a useful summary of the work done at the Plymouth, Port Erin, Cullercoats and Sutton Broad stations. Except for the invidious position we find ourselves in by its perusal, Mr. Juday's contribution is a welcome and useful one. We have long maintained that Yorkshire should have its Marine Biological Station, the coast is admirably adapted for it, and workers are not wanting.

PREHISTORIC ANTHROPOLOGY.

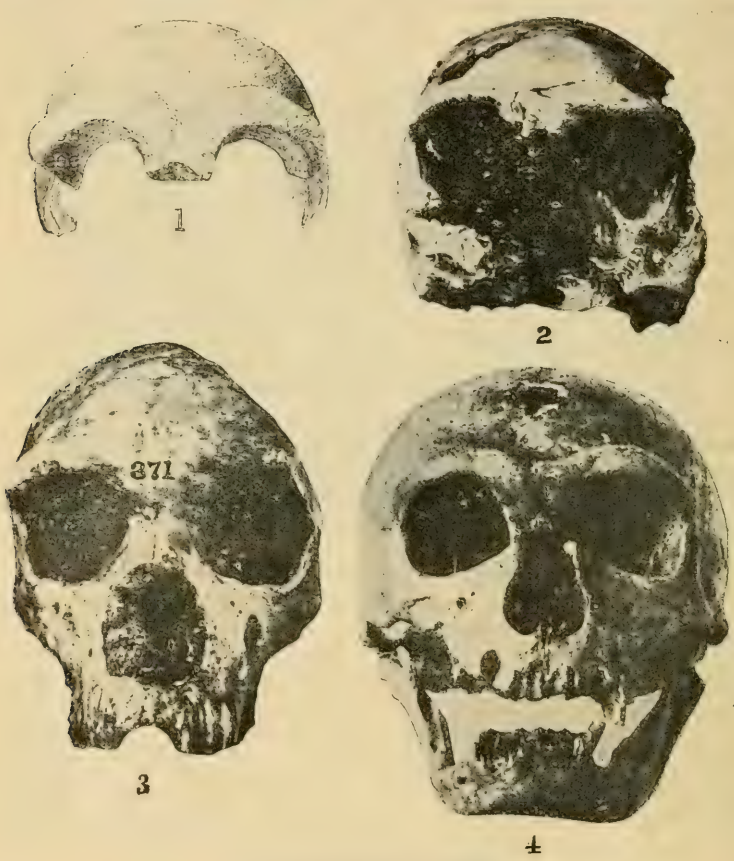
In many directions great strides have been made in recent times, and in most branches of science this is particularly so. It is now many, many years since the statement was made that we knew all that it was ever possible to be known about our early ancestors, and each year seems to shew that this statement is the more inaccurate. The study of prehistoric anthropology grows in interest as time goes on, and rarely a year passes but some important discovery is announced. These are being recorded in a series of books and monographs, which has recently grown to enormous proportions.

ANCIENT HUNTERS *

Prof. Sollas, who has given us such a number of important scientific treatises, has just issued a work which deals very fully and carefully with all the recent discoveries, and also ably compares the relics of early men with those found with

* ' Ancient Hunters and their Modern Representatives,' by W. J. Sollas. Macmillan & Co. 416 pp., 12/- net.

their modern representatives. The volume is based on a course of lectures delivered at the Royal Institution in 1906, and subsequently published in *Science Progress*. Since then, however, so many important discoveries have been announced that Prof. Sollas has had to considerably augment his notes. He has very carefully considered these different finds, and with the aid of his own vast experience and acquaintance with



Front view of Neandertal Skulls.
1. Neandertal. 2. Spy. 3. Gibraltar. 4. La Chapelle aux Saints.

the localities from which the more important objects have been obtained, he has been able to produce a masterly volume.

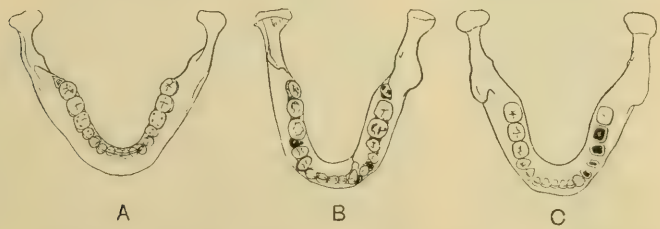
AND THEIR MODERN REPRESENTATIVES.

He deals with the various types of primitive man, illustrates his remarks by numerous blocks from drawings and photographs (one of which is reproduced herewith), and has drawn

upon an enormous number of monographs, printed in various parts of the world. He has also compared the remains of the ancient hunters with those of the Tasmanians, Bushmen, Eskimo and other tribes of to-day. But quite apart from the scientific information in the book, it will certainly find a permanent place in the annals of pre-historic anthropology, in view of the extraordinary lucid and fascinating character of the narratives. It is a long time since we read a book with such great pleasure.

PREHISTORIC MAN.

With this title Dr. W. L. H. Duckworth gives a lucid and concise summary of what is known of the various types of prehistoric man, paying particular attention to the earliest known remains. The volume is issued as one of the remarkably cheap shilling 'Cambridge Manuals of Science and Literature.' The six chapters are under the heads of 'The Precursors of Palaeolithic Man,' 'Palæolithic Man,' 'Alluvial Deposits and Caves,' 'Associated Animals and Implements,' 'Human Fossils



and Geological Chronology,' 'and Human Evolution in the light of recent research.' The illustrations also have been carefully selected, and admirably answer their purpose. We are permitted to reproduce one of them, which shews the differences between three types of human jaw bones. Fig. A is the lower jaw bone of a typical ancient Briton; B is a view of the Moustier jaw, found in Dordogne, France; and C is the Mauer or Heidelberg jaw. These views, together with the side views also given in Dr. Duckworth's volume, clearly indicate the differences in these types of skulls.

EVOLUTION IN THE PAST.*

It will be remembered that some time ago Mr. Knipe wrote a remarkable book, 'Nebula to Man,' in verse. In the present work, which covers a somewhat similar field, he gives an account of ancient life as now understood. The principal geological ages are taken as the basis of the divisions into which the book is made, and under these, the various periods, Cambrian, Ordovician, Silurian, etc., occur in their order. The author's

* By HENRY R. KNIPE. London: Herbert & Daniel. xvi.+242 pp., 12s. 6d. net.

object, however, is to give in simple language an account of the numerous extraordinary forms of animal and vegetable life that existed in these periods, at the same time keeping before his readers the fact that the modern highly developed species have gradually evolved from old and simple forms.

RESTORATIONS OF ANCIENT LIFE.

We cannot find that the book contains any new or startling discoveries, nor is this the author's intention. But he does seem to have carefully and conscientiously reviewed the enormous amount of literature bearing upon the subject, and he has included particulars of the more recent discoveries. To us, however, the most interesting part of the book consists of the remarkable series of restorations of ancient animal and plant life, from drawings by Miss Woodward and Mr. Bucknall, and as these have been carried out under the supervision of the various specialists at the British Museum, they can be taken as being as reliable as possible. Some of them are really very instructive indeed. Others set one thinking. We are permitted to reproduce one of them (plate III.), though this is on a smaller scale than appears in the volume. It represents our ancestors, *Pithecanthropus erectus* and is based on the remains found by Dubois in Java.

LANCASHIRE PIGMY IMPLEMENTS.

Messrs. W. H. Sutcliffe and W. A. Parker favour us with a reprint of their paper on 'Pigmy Flint Implements: their provenance and use: the Rochdale Floor,' a report of the discussion upon which appears in the *Lancashire Naturalist*, No. 47. The authors drew attention to the fact that certain South African tribes, experts in skin dressing, use an instrument made of a number of iron spikes tied round a piece of wood so that the points only project beyond it. It was suggested that the pigmy flint implements were probably inserted into a wooden frame, and used for carding skins. With this view Prof. Boyd Dawkins agreed. The Rev. R. A. Gatty, the 'one pigmy flint one pigmy man,' advocate, followed in the discussion, but apparently made no reference to his mythical pigmies, but 'expressed himself as more anxious to fix the period or age to which' the flints were related. He referred to the 'Auriguacien (sic.) Monsterian (sic), Solutrean (sic.) and Magdalenian' periods as apparently 'distinct in era from the India-Scunthorpe period.' The gods and Mr. Gatty only know what the 'India-Scunthorpe' period is.

AN INTERESTING PALAEOZOIC FERN.

Dr. D. H. Scott kindly sends a reprint of his paper in the 'Annals of Botany,' Volume XXVI., 'On a Palaeozoic Fern, the *Zygopteris grayi* of Williamson.' The name was

Naturalist,

first given by Williamson to some specimens from a coal-measure nodule found at Oldham. This was in 1888. Some time previously Williamson had recorded a stem of the same type, under the name of *Anachoropteris decaisnii*. Williamson's specimens, however, were never properly figured and described. More recently a series of sections from a specimen at Shore, Littleborough, has enabled Dr. Scott to prepare the present detailed memoir. He concludes that *Zygopteris grayi* is a member of the genus *Ankyropteris*, as shewn especially by the presence of peripheral loops on the leaf-trace.

YORKSHIRE TYPE AMMONITES.*

We are glad to find that part 6 of this important work has made its appearance, and contains illustrations and descrip-

tions of *Ammonites maculatus*, *heterogenes*, *integricostatus*, *siphuncularis*, *cereus*, *perarmatus*, and *athleticus*. The illustrations are quite equal to those in previous parts. One of them, viz. *Ammonites perarmatus*, we are kindly permitted to reproduce herewith. The original is in the Whitby Museum. The work is certainly worthy of every encouragement.

STRATIGRAPHICAL NAMES.

In the *Geological Magazine* for March, Dr. F. A. Bather rightly draws attention to the fact that it is time something was done in regard to the new names which are constantly being added to geological literature. His card index of names of geological formations, etc., has a thickness of two yards! He suggests that a committee should be appointed, say by the

* By S. S. Buckman Part VI. Wesley & Sons, 1912, price 3/3.

Geological Survey and the Geological Society, to which suggested new geological names should be submitted. He also opines that every geologist proposing a new name, whether in a memoir of the Geological Survey or in the Proceedings of the Little Muddleborough Field Club, should be invited to send the name, together with a definition, to some central source. He adds, 'It may, perhaps, be pointed out to me that, since the International Catalogue of Scientific Literature has a section for geology, that would be the proper place for indexing such names. Agreed! But all the same, the suggestion is not a practical one, so long as that partucular volume of the International Catalogue is thrown together (one cannot say 'edited') on its present lines.' We quite agree with Dr. Bather. By the way, we can't find 'Little Muddleborough' on the map. It must be somewhere near London.

THE MINERAL KINGDOM.

Parts 17-20 of this remarkable work have recently been published, and both as regards letterpress and plates, are well up to the standard of the previous parts, which is saying much. Each contains four large quarto plates, upon which the minerals are figured with surprising accuracy; even the metallic tints and lustres being faithfully represented. The work is by Dr. R. Brauns, and has been translated into English, with additions, by Mr. L. J. Spencer, M.A., F.G.S., of the British Museum. It is published by Messrs. Williams & Norgate, London, and will shortly be finished, part 25 being the last. When complete, the work will contain nearly a hundred plates, and 275 figures in the text.

A STRANGE ANIMAL.

In *Nature* (No. 2208) reference is made to Dr. Case's work upon the Permian vertebrata of North America, appearing in the publication of the Carnegie Institution of Washington. It is pointed out that 'the late Prof. Cope's hasty method of giving names to battered fragments of bones and teeth is proved to have hindered and complicated the study of the reptiles to which they belong. One specimen, indeed, which Cope described as a skull with the external nostrils situated beneath the end of the snout (*Hypopnous squaliceps*), is now known to be a normal skull with a second small skull, upside down, firmly adherent to the lower face of the snout and displaying its orbits, which were mistaken for the nostrils of the larger skull.'

We quote the following sentence from *The Zoologist* (No. 847, page 35), but must leave our readers to make the best of it:—'The cockerel that was let out was terribly fierce, and *his sister* (Mrs. Garratt) told me that after it (the cock) had killed all the rats at the mill, it then killed the cats that used to help to catch them.'

NOTES ON THE GEOLOGY OF THE VALE OF EDEN.

Prof. P. F. KENDALL, M.Sc., F.G.S.,
Leeds.

The Yorkshire Geological Society will make its Easter excursion to the Appleby district, and, though no excuse is necessary for transgressing the artificial boundaries that limit our county, there are peculiar reasons why we should overrun them in this particular direction. Not only do the outcrops of many formations run across, but many important problems in the geology of Yorkshire depend for their full elucidation upon the study of this area, and to none is it more important than to those connected with the events of the Glacial Period, and the still larger tectonic questions relating to the origin and history of the Pennine faults. The following notes are penned in the hope that a general description of the geological features lavishly displayed there, and the often very controversial problems awaiting solution will whet the appetites of those who intend to participate.

The broad, structural features of the Vale become at once apparent when the geological map is consulted. The Carboniferous rocks rising in a bold escarpment from the margin of the older rocks (Ordovician and Silurian) of the Lake District and the Howgill Fells, dip steeply away to the north-east, and descend beneath an unconformable cover of Permian and Triassic the largely drift-covered outcrops of which form the floor of the Vale. On the eastern side, the Vale is dominated by the abrupt, almost precipitous, wall of the Cross Fell range, another escarpment of Lower Carboniferous rocks upthrown by the gigantic system of the Pennine Faults. Between the Trias, however, and the Cross Fell escarpment, there is interposed a long narrow slip of Silurian and Ordovician rocks, thrust up between nearly parallel faults—this is the Cross Fell Inlier. A rough illustration of the disposition of the rocks may be obtained by taking a piece of cardboard, the size of this page, and cutting a horizontal slit from about an inch from the top left-hand corner to near the right-hand corner. Then cut obliquely from the left end well down the page. Lift the corner, and the flap will represent the northern end of the Pennines, while the portion on the right may represent the Carboniferous rocks underlying the Vale of Eden.

To the west the older Palæozoic rocks of the Lake District rise in what is *topographically* a dome with radial drainage, but a glance at the geological map shows that there is no obvious connection between this dome and the geological structure of the area; indeed, the laccolitic, lens-shaped, intrusion of igneous rocks invoked by Dr. Marr to explain the central uplift, remained unsuspected even by he officers of the Geological Survey, who mapped the country.

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The geological succession is shown in the following table, and, with the exception of the Upper Carboniferous, the whole of the rocks will be examined.

	Glacial Deposits.
Trias	St. Bees Sandstone.
	Red Marls.
Permian	Magnesian Limestone.
	Hilton Plant Beds.
	Upper Brockram.
	Penrith Sandstone.
	Lower Brockram.
Carboniferous ..	Coal Measures.
	Millstone Grit.
	Carboniferous Limestone and Yoredale Rocks.
	Basement Beds.
Silurian	Brathay Flags.
	Stockdale Shales.
Ordovician ..	Ashgill Shales.
	Keisley Limestone.
	Dufton Shales.
Cambrian	Corona Beds.
	Borrowdale Volcanic Rocks.
	Skiddaw Slate.

Igneous rocks occur in great variety, and these will be studied in two principal areas—one near Dufton, and the other, Carrock Fell, made classic by the researches of Mr. Harker.

The Whin Sill will be examined, but, unfortunately, the limits of time will not permit a visit to the Renwick-Armathwaite dyke, which is the continuation of the Cleveland dyke.

The Skiddaw Slate is generally a dark lustrous slate, with strong cleavage. It is so broken up by faults and thrusts, and so rarely fossiliferous, that, despite its enormous thickness and many excellent exposures, a clear succession is very difficult to establish. Near Carrock it has undergone metamorphism by contact with igneous intrusions, and beautiful examples of Spotted Slate and Chiastolite Slate will be seen.

The Borrowdale rocks are entirely volcanic (Andesites, Basalts, etc.). They will be seen at Eycott Hill, near Carrock Fell, and Rhyolitic lavas of late (Coniston Limestone), date will be well seen at several places in the Cross Fell inlier.

The Coniston Limestone Series to be studied in the Inlier, include black and grey shales, often charged with beautiful brachiopods, trilobites and graptolites, and a magnificent limestone—the Keisley or Staurocephalus Limestone, that, besides containing abundant corals, brachiopods, gasteropods,

and Orthoceras is, in some thick beds, so crowded with heads and tails of a great trilobite (*Illaenus bowmanni*) as to surfeit

Geological Map of the Vale of Eden.

one with the good things. Other trilobites, such as Sphærexochus and Cheirurus, occur more sparingly, and are the more prized.

The Silurian flags and shales are not particularly interesting,

save in Swindale Beck, where fine graptolites, two or three inches in length, are obtainable.

The next formation, *a longo intervallo*, is the Basement Bed of the Carboniferous Series. Two aspects of this rock are presented in the district: one composed of rocks of local derivation, is by all observers referred, without reservation, to the Carboniferous system. The contained pebbles accord with the immediately subjacent or adjacent rocks, whatever they may happen to be. At Shap Wells they include detritus of the Shap Granite, while a mile further south they consist wholly of Silurian rock. Near the source of Swindale Beck, and at other places along the foot of the Cross Fell range, vein-quartz from the Skiddaw Slates predominates, with a slight infusion of rhyolite.

The other type of conglomerate termed 'polygenetic,' is constituted of pebbles of a great variety of rocks, many of which, *e.g.*, Gneiss and Schist, are not recognisable in any part of the district. Dr. Marr is disposed to regard this conglomerate as a representative of the Old Red Sandstone, but it may be remarked that the submersion of the old land beneath the waters of the Carboniferous sea took place at so late a stage in some parts of the district that the conditions of the Old Red physical geography may well have persisted far into Carboniferous times.

The Carboniferous Limestone is displayed in fine sections, two of which, in Smardale and about Roman Fell, will be visited, when further additions to our knowledge of the 'phylum of the 'phyllums' may be anticipated. The Smardale section will probably prove of great interest as the limestone is traversed by a gorge exposing it from its base to its contact with the Permian. The Upper Carboniferous will not be encountered on any of the excursions.

The Permian Rocks of the Vale of Eden are of extraordinary interest. They commence with a basal conglomerate—the Lower Brockram—that rests in strong unconformity upon various members of the Carboniferous Series, but the constituent pebbles are practically a 'pure culture' of Carboniferous Limestone and chert. The succeeding Penrith Sandstone, 1000 feet thick, a bright red sandstone composed of quartz and felspar *without mica*, is, if such a thing exists in Britain, a true desert sand. The nature of the materials suggests its derivation from the waste of the Millstone Grit—the large size of the perfectly rounded sand-grains and the abundance of felspar in the undecomposed rock pointing to this conclusion.

The Upper Brockram consists of a series of beds of conglomerate interbedded with the top of the Penrith Sandstone. The contrast in constitution to the Lower Brockram is very

striking. While pebbles of Carboniferous Limestone still preponderate, there is a very large admixture of vein quartz and quartzite derived from the Basement Carboniferous, and a few pebbles of the Ordovician rhyolites. These facts shew clearly that the great Pennine fault scarp must have been formed before the deposition of the Upper Brockram, but the comparison of the two Brockrams makes it extremely probable that a large part, probably more than one thousand feet, of the movement of the Pennine faults, took place between the two; for otherwise we should have to assume that the 1000 feet of fault scarp buried beneath the Penrith Sandstone, stood exposed to the weather while the Lower Brockram was being deposited, yet contributed nothing to the gravels that were spread out at its foot.

The Hilton Plant Bed is of great interest, as it has yielded to a careful search, one of the best suites of Permian plants yet found in Britain.

The Magnesian Limestone will seem to the Yorkshire geologist Magnesian Limestone *pour rire*. It is only about twenty feet thick, and unfossiliferous.

The Triassic rocks present no special features of interest except that the basal marls appear to lie unconformable upon the Permian.

Igneous rocks of at least three geological dates, will be seen, and the appended notes kindly contributed by Mr. Alfred Harker, describe their mode and place of occurrence.

Tectonic Structure.—It has been already remarked that the Vale of Eden is bounded on the east by faults. One major dislocation extends from Scotland down to Stainmoor Pass, where it breaks up into a number of branches, and dies out. This great line of fracture is, however, not a single fault, but, from about Melmerby down to Roman Fell, it splits into three principal roughly parallel faults—the Inner (or Eastern), Middle, and Outer Pennine Faults of the Geological Survey. The Inner throws the Skiddaw Slate and other older Palæozoic rocks against the Lower Carboniferous of the Cross Fell range. The Outer throws down the Trias on the west against a long cross-fractured slip of Ordovician, Silurian, and Lower Carboniferous rocks that has been carved by the weather into the remarkable and picturesque line of Pikes.

In a few places the position of the main faults can be fixed to within a yard or two, and broader views of the scenery indicate their position by the striking contrasts of vegetation and aspect.

The geological date of the faulting movements can be ascertained with fair accuracy. Pre-Carboniferous movement of the middle fault is clearly indicated by the fact that the Pikes are composed mainly of the Coniston Limestone Series

and of Silurian rocks, whereas the Cross Fell escarpment consists of Carboniferous rocks resting on Skiddaw Slate, which also forms the belt between the Inner and Middle faults. This movement must have been a downthrow to the west. A movement of the Inner Fault at a later date, dropped the Carboniferous rocks on the east against the Skiddaw Slate.

The Outer Fault, the line of principal movement, commenced its operations at least as early as Permian times, and probably was also pre-Carboniferous. Its latest movement took place at some time after the deposition of the Trias. The total amount of displacement effected by it must amount to at least the aggregate thickness of the Carboniferous Limestone, Permian and Trias, plus the height of the Pikes, and may well be more than the 7000 feet that this, very roughly, represents.

Glacial Phenomena.—Goodchild's admirable account of the Glacial Deposits and the distribution of Erratics in the Vale of Eden furnishes a basis for further work that can hardly be over-valued. He showed that at the climax of the glaciation a great ice stream from the Solway was forced up the Vale from N.W. to S.E., and that, reinforced by other ice flowing from the southern slopes of the Howgill Fells, it passed over the Pass of Stainmoor into the Tees drainage, bringing with it boulders from the South of Scotland, as well as innumerable blocks of Shap Granite, and such characteristic rocks of the Vale of Eden as the so-called 'granite' of Dufton Pike, and the Brockram.

Mr. Goodchild further showed that the blocks of Shap Granite were distributed so far down the Valley, as well as over against the Cross Fell inlier, as to indicate more than one phase and direction of dispersal.

My own researches, extending over fifteen or eighteen years, are entirely corroborative of Goodchild's main conclusions. I find that along the eastern edge of the Vale a series of channels draining small lakes held up in the recesses of the Cross Fell range and among the pikes of the Inlier trench across practically every spur or col. The whole form parallel and aligned systems, all draining in a N.W. direction to the neighbourhood of Brampton, where cross-cuts connect them with the similar series of channels in the Valley of the South Tyne described by Dr. Dwerryhouse.

A remarkable fact whose significance flashed upon me with startling suddenness, is that some of the spurs, *e.g.*, Murton Pike, have large crescentic channels excavated in their *Southern* flanks in such a way as to show that at the time of their formation, the ice was moving contrariwise to the more general flow, *i.e.*, down the Vale instead of up. Moreover, at the southern extremity of the Vale during the closing stages of glaciation, the ice in Ravenstonedale from the Howgill Fells

pressed against the escarpment of Carboniferous Limestone, and water flowing along its edge, doubtless from small glacier lakes, cut on the slopes of the escarpment a pair of marginal channels, converging on Smardale which was, if not produced, at least deepened by the flow of water. This must have been after the retreat of the Solway ice. Dr. Marr at one time was inclined to attribute the Smardale Gorge to river capture, but the hypothesis here proposed was, I believe, independently suggested by Prof. W. M. Davis a year or two ago.

Many other fascinating problems must engage the attention of the glacialist in Edenside, one of the most attractive and yet—or perhaps because—difficult is the question:—How did the Stainmoor glacier meet its fate? Did it dwindle on the top of the Pass by failure of supplies from the west, or did its lower end become detached from the Tees glacier, of which it was a feeder, and retreat back after the manner of a glacier fed from a mountainous snowfield? In the former case, it would have a free upper end, as, though for a different reason, some of the glaciers of Spitsbergen have.

A beautiful terminal moraine at High Cup Gill will be seen. It appears to have been formed, not by a glacier coming *down* the valley, but by an ice-lobe pressing across a col on the north side of the valley, and casting down its moraine on the opposing slope.

The menu here exhibited promises a satisfactory geological repast to those who can afford time for the 'table d'hote,' but even a single item 'à la carte' might appease the appetites of those who can spare but a single day.

——:o:——

APPENDIX ON THE IGNEOUS ROCKS.

ALFRED HARKER, F.R.S.

Edenside.

The Dufton Rhyolites.—Owing to repetition by faults, the old acid lavas associated with the Coniston Limestone group appear at three places in the Edenside inlier: Knock Pike, Dufton Pike, and Gregory Hill. They are pale compact rocks probably in part devitrified obsidians, and resemble generally the corresponding rhyolites on the southern border of the Lake District. As exposed in Swindale Beck, they show flow-structure, and often enclose little fragments of andesite, giving a deceptive appearance of a volcanic ash.

Acid Intrusions.—There are several intrusive masses of quartz-porphyry, etc., which are also to be referred probably to a Lower Palæozoic age. The most noteworthy is a small boss of granite-porphyry on the west side of Dufton Pike.

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It is a red, fine-grained rock, with conspicuous large crystals of white mica, besides quartz-grains and flakes of black mica.

The Mica-Lamprophyres.—There are numerous small dykes and sheets of mica-lamprophyre in western Yorkshire and eastern Westmorland, and their approximate age is fixed by the fact that they traverse all the Lower Palæozoic strata, but never enter younger formations. The best-preserved example makes an irregular intrusion in Swindale, and is easily recognized by its abundance of dark mica. Like other occurrences of this group of rocks, it encloses scattered grains of quartz, more or less corroded.

The Whin Sill.—This is the most southerly example of a group of sills and dykes of late Carboniferous or Permo-Carboniferous age, largely represented in the southern half of Scotland. The rocks are quartz-dolerites. What is seen in the Carboniferous escarpment at High Cup Nick is merely the western termination of a thick sill, which can be traced as far as the coast of Northumberland and the Farne Isles. The very coarse variety of the rock, as exposed in Teesdale, is not seen here.

Carrock Fell District.

Ordovician Volcanic Rocks.—The Volcanic Series, as it occurs on the north side of Carrock Fell, is represented chiefly by basic lavas of a type which makes a large spread in the Lake District. They are *basalts*, without olivine, but often containing little pseudomorphs after hypersthene. They are best seen in Eycott Hill, and the most striking variety there is one containing large porphyritic felspar crystals (labradorite-bytownite). In Drygill, associated with strata of the Coniston Limestone group, are some relics of *rhyolite* lavas, much altered and poorly exposed.

The Carrock Fell Intrusions.—The higher ground here is made by two laccolitic intrusions, one of basic and the other of acid rock. On the south side, and extending westward for some miles, is a coarse *gabbro*. It varies much in composition, with gradual passage from one variety to another. The central portion is a quartz-gabbro, and the rock becomes progressively more basic towards its margin, the actual edge being made by a remarkably dense and dark variety, rich in titaniferous iron-ore. Enclosed in the heart of the gabbro in numerous places are patches of basalt, like that of Eycott Hill, much metamorphosed. North of the gabbro, and making the summit of the hill, comes a *granophyre*, intruded later than the gabbro, and partly overlying it at a steep inclination. It is a relatively pale and fine-textured rock, but becomes richer in the dark minerals towards the southern (or lower) edge. Where it comes into contact with the peculiar basic margin of the gabbro,

some very remarkable hybrid rocks have been produced by their mutual reactions.

The Grainsgill Intrusion.—This breaks through the Skiddaw Slates a little above the confluence of Grainsgill Beck with the River Caldew, and is exposed in both streams. It is one of the outcrops of the Skiddaw granite, and is doubtless in subterranean connection with the others to the S.W. and S. As seen in the Caldew, the rock is a *granite*, with both dark and white mica. Farther north the white mica rapidly becomes more plentiful, while the dark disappears, and the felspar is increasingly replaced by white mica and quartz. The resulting quartz-mica-rock, which may be termed *greisen*, is in Grainsgill often of rather coarse texture, and it may be regarded as a pegmatitic modification of the Skiddaw granite, in which the felspar has been converted to mica and quartz.

The Metamorphism of the Skiddaw Slates.—The Carrock Fell gabbro has not produced any high grade of metamorphism in the Skiddaw Slates on its southern side, and indeed the observed boundary is clearly a faulted one. As the slates are followed westward up the Caldew Valley, however, they are seen to become more and more metamorphosed and visibly crystalline, the change culminating in the vicinity of the greisen of Grainsgill. The most important new mineral formed is Cordierite,* and in the most highly altered rocks this mineral, with mica and minute garnets, makes up practically the whole mass.

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MOLLUSCA.

***Testacella scutulum* at Brighouse, Yorks.**—During November 1911, I obtained seven specimens of *Testacella scutulum* from Mr. Lister Kershaw, Brighouse, and he informed me that during the summer they could be found in considerable numbers. During the last week of February 1912, Mr. Kershaw was removing some rose trees, and in the first spit of ground turned over, the slug was found in large numbers, though there were none in the subsoil. It has only been recorded from two other places in this area, 63, S.W.Y. It has been noticed for about twelve years by the gardeners at Brighouse. I have a few specimens in formalin, which I shall be pleased to send to any conchologist interested.—J. H. Lumb, Halifax, March 15th, 1912.

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The Selborne Magazine (No. 267) is largely occupied by an interesting Catalogue of the Gilbert White Exhibition.

'Some Birds new to Ireland' is the title of an illustrated article by Prof. C. J. Patten, in *The Irish Naturalist* for March.

* 'The Naturalist,' 1906, pp. 121-123.

COAST CHANGES AT HORNSEA.

T. SHEPPARD, F.G.S.,

(PLATES VII. to XI.).

For centuries the question of the erosion of the Holderness coast has been a serious one for those who own the land or are in other ways connected with the seaboard. The action of the sea in washing the soft clay cliffs away at an average rate of seven feet a year, has wrought many changes in the district. Lakes have been tapped and drained, towns and villages have been washed away, lands have been flooded and destroyed, islands have been formed, and have again disappeared; important ports have sunk into insignificance, and small villages have sprung into importance.

The story of all these vast changes is a fascinating one, though a long one. In the present notes, however, which form merely a single chapter in the history of the lost towns of East Yorkshire, it is proposed to refer to the changes that have occurred at Hornsea, a place which occupies a position about the middle of the coast, and is now a quiet watering place and holiday resort.

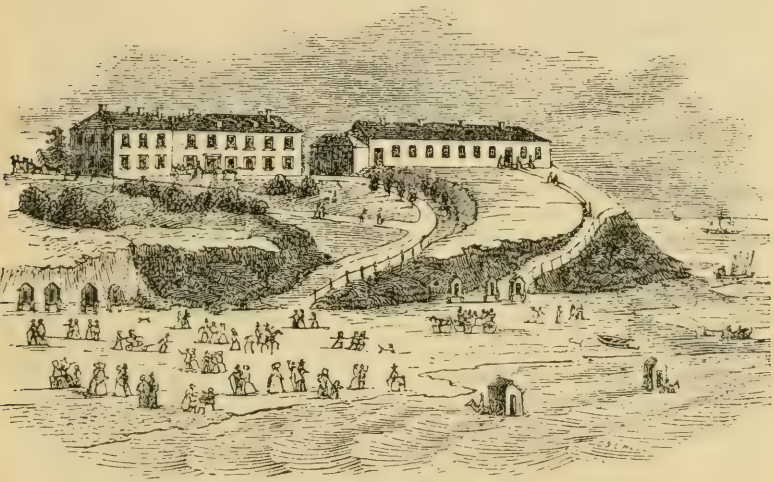
In early times there were two meres at Hornsea. One was subsequently washed away, its site being where the beach now is. A section in the old mere bed was exposed a few years ago, and was described in this journal at the time. Later the place became important as a port. It had a substantial pier, and, apparently, a haven. Notwithstanding many costly repairs, the pier was washed away by the sea. So important was the port of Hornsea in the middle ages, that the dues paid there represented a sufficiently tempting amount to cause serious disputes between the different bodies who considered they were entitled to share them.

In addition to Hornsea proper, there were townships at Hornsea Beck and Hornsea Burton, practically all of which have been swept away.

According to Poulson, the Holderness historian, Hornsea Burton was 'dilapidated' in 1840, though during the time of the Domesday Survey (1086) it was a place of some importance, and had two carucates of land under the plough. Even so early as 1200 a grant of fourteen oxgangs was made from Galfrid de Oyry's land, which was valued at 100 shillings yearly: a considerable amount in those days. From 'Kirby's Inquest' in the thirteenth century, we learn that the heirs of Gilbert de Mapleton' held in Hornsea Burton six carucates of land, equal to about 720 acres. As a result of the wearing away by the sea, there were in 1852, 409 acres only, and to-day

there are considerably less. Whytehead, writing in 1786, recorded that ' there is nothing now worth notice in the place, consisting only of one or two farm houses.'

Between 1845 and 1876 the loss of land at Hornsea Burton farm house was four feet a year, whilst between 1876 and 1882 the loss was fifteen feet a year, the increase being probably due to the erection of groynes at Hornsea. Thus a strip of land 71 yards wide was washed away between 1845 and 1882. The view of the cottage on the accompanying photograph (plate VIII.), shows that its future life will not be a long one.



The Marine Hotel, Hornsea, in 1845.
Much of the cliff shown in this copy of an old print, has since been washed away.

About the year 1550 Holinshed published a ' list of such ports and creeks, as our seafaring men doo note for their benefit upon the coasts of England,' and in it he mentions ' Hornessiebecke.' A little later, just before the Armada scare, a gaudily-coloured ' Plotte made for the description of the River of Humber and of the sea and Seacoost from Hull to Skarburgh ' was prepared, an excellent reproduction of which was published by Messrs. Peck & Son, Hull, some years ago. Upon this a creek at Hornsea, for the anchorage of small vessels, is distinctly shewn, as well as a pier. To-day, of course, there is absolutely no creek or harbour whatever, the only water joining the sea being the Mere 'stream-dyke,' which can be easily jumped over, and is dried up in the summer.

With regard to this pier, from an Inquest held in the reign of James I., it seems that the structure had cost £3000 (a very

large sum in those days), and that 2500 tons of timber had been necessary to repair it.

In more recent years a pleasure pier was erected at Hornsea, but this, too, has gone.

So long ago as 1228, Walter de Spiney gave to Meaux Abbey, near Beverley, his 'whole profit of merchandise and of every ship applying at the port of Hornsea.' The power of making this grant was disputed, the profits collected on vessels lying north of Hornsea Beck apparently belonging to the domain of Hornsea, while south of the stream they belonged to the lord paramount of Holderness. As a consequence Meaux Abbey did not benefit from the tolls.

In these early times, too, we get evidence of the effects of the loss of land. From an inquisition held at Hedon in the year 1400, it is evident that in 1334 Meaux Abbey held at Hornsea Burton 25 acres of arable land, for which they received 2s. per annum, but of which at the close of the century one acre alone remained. Thus, in the fourteenth century, 26 acres had been washed away during a period of seventy-six years.

Similarly, in 1609, an oath was made to the following effect: 'We find decayed, by the flowing of the sea in Hornsea Beck, since 1546, 38 houses, and as many closes adjoining. Also we find, since the same time, decayed in ground the breadth of 12 score yards throughout the field of Hornsey, being a mile long, and parcel of the aforesaid manor. We further find that there will be great hurt and damage to the king's demesnes and pasture grounds near adjoining the said Hornsey Beck, within the manor of Hornsey, to the great hurt and impoverishing of the inhabitants of Hornsey, if that a present remedy be not made, either by re-edification of a peare or some other good defence for the same, for the safeguard of the said lands and country adjoining. And further, for the charge of the same, we find that the last peare built at Hornsey cost £3000 or thereabouts, and it will cost much more than it did then. . . . John Galloway, of Hornsey, pannierman, of the age of 80 years, says he had known 39 houses and 39 closes wasted away, of the yearly rent to the king of 58sh. 6½d., and that there doth usually every year waste the breadth of 40 feet, which is more than heretofore; and that there are divers meadows and pasture grounds, called the King's Demesnes, of the yearly value of £11 18s. antient rent, which will in short time be wasted and con umed, with a great part of the town of Hornsey, without a peare, which he thinketh will amount to 2500 trees. Edward Harrison, of Seeton, husbandman, aged eighty years, says that he has known 300 yards washed away, and that there was a peere at Hornsey Beck, during the continuance whereof the decay was very little."

On November 1st, 1757, Mr. Joseph Harrison measured

" the distance from the north-east corner of Robin Maudley's house, at the seaside, to the edge of the cliff, along the balk, next the ditch, it was 61 yards 4 inches. April 2nd, 1759, . . . the distance was then 50 yards, so that in one year and five months the sea had gained 11 yards and 4 inches; at the same time the distance from the beacon to the edge of the cliff was just 19 yards. The foundations of the house alluded to were washed away in 1785, and the beacon was removed about 14 years before that."

In the year 1786 the distance from the church to the sea-side was measured by Mr. John Tuke, surveyor, of York, when it was found to be due east 1113 yards. Mr. Harrison took the distance from the cliff in 1759. The distance from the church (east end) in December 1876, was only 1000 yards, making a deficit of 133 yards from the period of its admeasurement by Mr. Tuke." In 1895, according to the Ordnance Survey, the distance was 898 yards.

In a letter written by the rector of Atwick, dated September 19th, 1787, he states, " the place where the stream dyke empties itself into the sea for about eight months in the year, when there is a current from the Mere is . . . called the Beck; near this beck the town was situated. Two or three years ago the Beck took another current to the sea 140 yards south, and from the place where Robt. Maudley's house stood by the sea, overflowing its banks, and filling up with sand its antient course, so that Mr. Bethell's manor is increasing in the same proportion as Mr. Constable's is decreasing. . . . Hornsea Beck has now altogether disappeared."

There was a bridge over Hornsey Beck in 1440.

In 1390, Robert Ticlot of Hornsea Beck willed to his wife Johan a ship called " *Fartoft*," in order that she might make provision in the church of Hornsea for her own soul and the souls of her father and mother. He also left a small vessel, called " *Maudlin*," to his brother, and another to John Skelton for the same purpose. These early references indicate that vessels were safely harboured at Hornsea. It is also interesting to notice that the one private token issued in Hornsea by Benjamin Rhodes, and bearing the date 1670, has a representation of a full-rigged ship on the obverse.

Even as early as 1257 Henry III, granted a charter to the abbots and monks of St. Mary's, York, for the holding of a market at Hornsea every Monday, which was continued until the end of the eighteenth century. Up to the time of the dissolution of the monasteries by Henry VIII., Hornsea, " with its tithes, trade, and fisheries was the most valuable possession of the abbey."* In addition to the ship's tolls, the land tithes,

* Fretwell's Hornsea, 1894, p. 37.

wrecks, assize of bread and beer, and tolls from the markets, the abbot claimed a toll from strangers passing through the town, known as chiminage. To assist the abbots in exercising their judicial functions there were gallows, tumbrils, pillory, and a prison, and writs were frequently issued against the abbots "by reason of their oppression and rapacious tyranny."

The rate of erosion of the cliffs at Hornsea is very irregular, and varies considerably over different periods. At the northern end of Cliff Lane it averaged 2.5 yards for 67 years, or 167·5 yards in that period, whereas near the Marine Hotel, where the cliffs are partly protected by groynes, the loss is only 1.9 yards a year, or 123 yards in the same period.

The erection of strong sea-defence works at Hornsea has practically resulted in erosion here being stayed, otherwise in time the well-known Mere would have been tapped by the sea, with disastrous results to Hornsea. Mr. Matthews records that within the memory of comparatively young people at Hornsea, 'hotels, houses and cottages have had to be pulled down owing to the persistent advance of the sea, and many have been swept away by the waves.'

It occasionally happens that the erosion of the coast is not altogether a disadvantage. For example, in 1770, the corpse of a murderer and smuggler named Pennel, was bound round with iron-hoops and hung on a gibbet on the north cliff, until such time as the 'ornament' was washed away.

Southorpe, a township within Hornsea, contained 580 acres in 1786. Now everything has been washed away. It was situated immediately south of Hornsea—hence the name—being the South Thorp, or village, with respect to that place. In Domesday times it contained a carucate and a half of arable land.

Northorpe was formerly situated north of Hornsea, bearing a similar position on the north side to that of Southorpe of the south. But little appears to be known of it beyond the name. Poulson records that old people recollected seeing stones, etc., being dug up, evidently parts of buildings.

Hornsea Mere.

This sheet of water has been the cause of much trouble in the past, and it is evident that the fish and fowl it harboured were worthy of consideration. So long ago as 1260 William, 11th Abbot of Meaux, claimed the right of fishing in the south part of the Mere, and this right was opposed by the Abbot of St. Mary's. It was decided to settle the controversy by combat. Champions were found on either side, and after a fight which, it is stated, lasted all day, the fishing was relinquished by the Abbot of Meaux.

Poulson quotes 'Burnsell on the East Riding,' preserved in the British Museum, as follows:—'A water prettie deep, and always fresh, about a mile and a half long, and half a mile broad, well stored with fish; it hath in it three little plots, two of them full of egs of Tems [? Terns] at the season, and birds as can be imagined; it is fed with the water that ran into it of the adjoining higher grounde from the north, south, and west, eastwards it runs up into the sea by a ditch, call'd the stream ditch, when the clew is open'd, there are mannie springs in it also; the soyle is in some places gravel'd, in others a perfect weedy morass; that this mere hath been through some earthquakes and settling of the ground, with an overflow of water thereupon, seems probable, speciallie if that be true which I was told that there hath been seen old trees floating uppon, and deca'd nutts found cast on the shore, but, however, that be this is certain, that in the sea cliffs against Hornsey, which is scarce a mile of, there is both wood and nuts to be found, and there is now or was lately there, at the downgate a win of wood which looks as black as if it had been burnt, which I think is occasion'd through the saltness of the sea water overflowing it, which both preserves wood better than fresh water, and also by its saltness, and consequently greater hotness, help to turn it black, all this intimates that there hath been an inundation there; but when no historie, I believe, relates, unless it was in that earthquake, which was so generall through the world in the time when Valentinian and Valens were consulls, anno Christ 368; unless we should think as the vulgar say, those things hath been there ever since Noah's flood; this place bids as fare for anie other place I have heard of yet; I scarce think either wood or nutts can continue so long, though kept never so close from the violent motion of the air, &c.'

Bearing on this, it is interesting to note that a section of the old mere was exposed in the cliffs in 1906, and a description of this, with a list of the shells, seeds, etc., found, appeared in *The Naturalist* for that year (page 420). One fact brought out in connection with this paper was that the numerous remains of animals and plants preserved in what was once the bed of an easterly extension of the present Mere, or more probably another mere altogether, clearly indicate that the mere had not been encroached upon by the waters of the North Sea. The fauna and flora is such that certainly could not have lived in water containing any appreciable admixture of salt.

On geological evidence, therefore, it seems clear that there has at no time been a connection between either of the meres at Hornsea and the sea.

A few years ago on the site of the gasworks, which are on the edge of the present Mere, an excellent opportunity was afforded of examining the old deposits there formed, and

these again clearly indicated that the salt water had not at any time reached the lake.

I am indebted to Messrs. J. W. Stather, H. S. Harker, F. H. Wood, and Barr for the photographs accompanying these notes.

FIELD NOTES.

BIRDS.

Bohemian Waxwings at Grange-over-Sands.—On the 2nd of March, a small flock of about eight Bohemian Waxwings, comprising both sexes, paid a brief visit to my garden.—HERBERT WALKER, Grange-over-Sands, March 13th, 1912.

The Common Sandpiper in March.—On March 12th I was surprised to see a Common Sandpiper in Derbyshire, a few miles to the north of Burton-on-Trent. I had a very good view of the bird, which, on being disturbed, flew across a small sheet of water, and alighted on the opposite side, further away. As this date is so early, in spite of the recent genial weather, it is possible that this may be one of the few birds of this species that are reported to spend the winter in the extreme south-west of England.—H. B. BOOTH, Ben Rhydding.

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BOTANY.

The Wood Scirpus (*S. sylvaticus*) in East Yorkshire.—I noted *Scirpus sylvaticus* in Firby Wood, Kirkham, on the 13th June, 1908. The species is not included in Robinson's 'Flora of the East Riding of Yorkshire.'—W. INGHAM, York.

Mosses and Hepatics at Knaresborough.—In addition to the species enumerated by Mr. Cheetham, in 'The Naturalist' for March (page 95), I obtained two interesting hepatics, viz., *Lophozia turbinata*, and the small *Haplozia pumila*, growing in thin dark green patches closely pressed to the rocks. Mr. Cheetham also obtained the vivid green moss, *Barbula vinealis* on the top of a grassy mound.—W. INGHAM, York.

***Roesleria pallida* (Pers.) Sacc., in Yorkshire.**—On roots of dead apple tree. Collected by Miss F. Bentham in the garden of her residence, 'The Towers,' Castle Hill, Scarborough, January 1912. Communicated by Mr. T. B. Roe, Scarborough. Miss Bentham says the apple tree—a young one—bloomed last year, but no fruit set, and the tree is now dead, and she is of the opinion that the tree was killed by the fungus. This species is parasitic on roots of apple, pear, and probably other fruit trees; also on vine roots.—C. CROSSLAND, Halifax.

In Memoriam.

WILLIAM FOWLER.

Born 27th February, 1835; Died 7th March, 1912.

(PLATE II.).

On the 7th of March, at his native village, Winterton, Lincolnshire, the first President of the Yorkshire Naturalists' Union passed to his rest. He was buried beside his devoted wife at Liversedge, on the 9th, amid signs of general mourning. Indeed, there could be no more convincing evidence of the affection in which he was held at Liversedge, than the immense concourse assembled at his funeral; at which two Ex-presidents, Mr. Geo. T. Porritt, F.L.S., and Mr. W. Denison Roebuck, F.L.S., represented the Yorkshire Naturalists' Union, the latter also representing the Lincolnshire Naturalists' Union.

Canon Fowler was one of the sons of the late Joseph Fowler, architect, and grandson of the well-known antiquary, William Fowler. In 1864 he married Miss Williamson, of Cleckheaton. He was a scholar of Christ's College, Cambridge, taking his B.A., 1857, and his M.A. in 1860. He was curate of St. John's, Cleckheaton, 1859-64; Vicar of Liversedge, 1864-1910; Honorary Canon of Wakefield from 1906. This, however, gives but a dim idea of the work of this most kindly and sympathetic of men. The new church in his old parish is the most substantial memorial of his life's work; but perhaps the most interesting is the beautiful chancel screen which his late parishioners erected after he left, as a token of their esteem, and as a trifling recognition of his devoted services, which two personal friends, Bishops of Wakefield, equally recognised. It is not for us here to enter upon this side of his activity.

Canon Fowler was a man of wide sympathies, interested in a whole range of subjects, and with a keen grasp on all alike. He was an evolutionist of the modern type. Botany, in its widest sense, was the study of his life; so far as we know he was the first œcological student of environment as regards soils, amongst British botanists. We possess notes of his going back to 1852, and his work in botany ended with critically naming in January last, the first Lincolnshire specimen of *Carex axillaris*, which showed by its barren fruit that it is nothing but the *C. vulpina* × *remota* hybrid. The Phaenogams are considered by most men enough for their energies, but the larger fungi and freshwater algæ were not forgotten by the Canon. His diligence and example have not gone entirely unrewarded in the hearts and lives of his contemporaries and pupils.

Though the Canon was distinctly a worker and raconteur rather than a writer, he did a little literary work at times besides his sermons. Apparently his first contribution towards the

botany of his native county was on *Salicornia herbacea and Common Plants in Lincolnshire*, in *The Phytologist*, 1857, p. 302. This was followed a year later in the same journal, by *The Rarer Plants of the Neighbourhood of Winterton, Lincolnshire*, enumerating some eighty species. After this for some years he was specially occupied in assisting the late H. C. Watson with additions towards a second edition of the *Topographical Botany*; though this did not see the light till after its author's death, in 1883. From 1874 to 1887 he was busy collecting for his friend, Mr. F. A. Lees, for the *Botanical Record Club*. For the purpose of getting the specimens he required in North and South Lincolnshire, Canon Fowler practically wandered over every soil, most of the larger woods, and many an interesting nook and corner of the county. This led to a series of articles on plants in relation to soils, which appeared in *The Naturalist*, 1878-90:—*Lincolnshire Coast Plants*, 1878; *Lincolnshire Marine Plants*, 1879; *Lincolnshire Bog and Moorland Plants*, 1887; *Lincolnshire Marsh and Water Plants*, 1888: *Lincolnshire Sand and Clay Plants*, 1889; *Lincolnshire Limestone Plants*, 1890.

In the carefully worked out first records possessed by the botanical secretary of the Lincolnshire Union, the result of his work stands as follows in new species, or good varieties added to the county list:—one in 1855; seven in 1856; five in 1857; four in 1858; one in 1868; one in 1870; one in 1872; one in 1875; twelve in 1876; eight in 1877; eleven in 1878; four in 1879; one in 1880; two in 1881; three in 1882; one in 1884; one in 1889; one in 1891; one in 1892; one in 1893; one in 1894; one in 1896; one in 1898, in all, seventy species and good varieties. Considering the work of a long line of botanists from Gerarde in 1597 to Watson in 1851, the result of whose united labours has now come to light and robbed the Canon of half his records, his list is a splendid one, and demonstrates what a field worker he was. It contains *Lycopodium alpinum*, which is now believed to be extinct with us, and *Selinum Carvifolia* in 1881, a first record for Britain, and now demonstrated to be a true native; as well as many other species of the greatest local interest.

His connection with Natural History Societies was coincident with his botanical career. He was President of the old West Riding Consolidated Naturalists' Society at the time (1876-77) when it enlarged its scope, and became the Yorkshire Naturalists' Union, of which in consequence he was the first President, and he was re-elected to the chair many years later. He was President and the moving spirit of the Liversedge Naturalists' Society so long as it lived.

He was a leading and valued member of the Lincolnshire Naturalists' Union, and its fourth Presidents.

If we ended here we should do scant justice to Canon Fowler; the man himself was finer than all his activities and interests together. An individual may be a keen worker and faithful student, and win his honorary canonry almost as a matter of course; he may be an enthusiastic lover of nature, and a fair observer, and yet 'a dull dog' withal. We have met many such, without the touch of kindly human sympathy in their nature, or a sparkle of wit and humour in their composition. No one could be alongside Canon Fowler, either in his own home or elsewhere, without appreciating his deep sympathy with the failings of common humanity, the truly kindly geniality of his nature, and its sweet ebullition of sparkling, playful fun. He had the eye, brain and sympathy which can see the humourous play of the underside of daily life, as well as in its brightest moments, and respond at once, as naturally as to its disillusionments, weariness and sadness. He had a good memory for dialect, forms of expression, intonation of voice, and those personal peculiarities of manner which, together, make up the sum of the individual character, which, when exerted in his own kindly mood, can only produce side-shaking laughter. He was one of those who think that to play in earnest is as essential as to work in earnest.

An interesting poetical letter to Canon Fowler, from his friend the late Dr. Walsham How, Bishop of Wakefield, is given in *The Naturalist* for 1897, page 307.

E. A. W.-P.

PHINEAS FOX LEE.

Fortunately, it seldom falls to our lot to have to record at so short an interval the deaths of two men who have worked so long and persistently in the interests of Yorkshire natural history as Canon W. Fowler, and Mr. P. F. Lee. The north of England has long been fortunate in possessing a large number of amateurs in science, and the two who have just passed away were typical and worthy examples. They were two of the oldest members of the Yorkshire Naturalists' Union, and their inborn love of nature and their enthusiasm for the subject of their choice, influenced for good all with whom they came in contact, and they were ever ready to encourage and guide younger men along useful channels of enquiry.

Mr. Lee was born at Dewsbury, and was the son of Mr. Isaac Lee, a musician, and, adopting his father's profession, became a successful teacher. His spare time was devoted to botany, and when quite a young man, he interested himself in the Dewsbury Mechanics' Institute, one of many similar

institutes in the West Riding, which had for their object the mental improvement of those whose lot it had been to receive little or no elementary education. In such evening schools many men now occupying prominent positions received that added knowledge and desire for improvement which proved a stimulus for further and successful effort. In those days the schools were mainly maintained by local subscriptions, and most of the teaching and official work was voluntary. A man of Mr. Lee's temperament found here an outlet for his enthusiasm for education, and in 1873 and for many years afterwards he acted as Hon. Secretary, a post which involved much work, as he had to organise and direct the whole work of the Institute. It will ever stand to the credit of men like Mr. Lee that they should have given so much of their spare time and energies to such a cause. In comparing the work then with present-day conditions of well-equipped rooms and a goodly supply of apparatus, he used to say it was 'all blackboard and chalk'; nevertheless, there was behind the old amateur teaching the energy of the enthusiast which counted for much. Under his care the Institute developed rapidly, and the work becoming too onerous, he was eventually invited to accept the salaried post of Secretary, for which his past experience so well fitted him. He was appointed, and up to his death gave his whole time to the work.

Phineas Fox Lee.

From small beginnings the Mechanics' Institute developed into the Technical School, and fine new buildings were erected to meet the increased demand for more and better accommodation. Here he did excellent work, and the school was one of the best cared for in the North of England. He was a genial and helpful colleague, and companion, and was held in high esteem by all who knew him. Throughout this period he took a keen interest in botany, and had an extensive herbarium. For some years he was Secretary of the Botanical Section of the Y.N.U., and afterwards president of the section. He served on the Executive of the Union, and there as on the excursions, was a welcome member. Formerly he was connected with the Botanical Exchange Club, and acted as distributor. Along with the late C. P. Hobkirk and others, he took an active part in founding the Dewsbury museum, and was much interested in adding to the collections.

No one knew the local flora better than he, and his 'Flora of Dewsbury' and the Supplements to it published by the Yorkshire Naturalists' Union attest to his painstaking work in this direction.

In his later years he paid much attention to the puzzling and erratic 'aliens,' which crop up in such large numbers on the waste heaps near the mills, and these he embodied, along with additions to the native flora, in a further supplement now ready for publication.

He maintained his interest for his favourite study to the last, and seldom failed to pay a visit to the Botany Class in his school, which was fortunate in possessing a very well-equipped and convenient laboratory, thanks to the help and encouragement given by Mr. Lee during its construction. He visited the class, as usual, on Monday evening, just before leaving for the night, and this was his last official act, for in the early hours of Tuesday morning, March 12th, he suddenly passed away. He was buried at the Dewsbury Cemetery.

T. W. W.

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The *Journal of the Board of Agriculture* for February contains papers on 'Varieties of Willows' and 'Tomato Leaf Rust.'

In *Knowledge* for March Dr. R. F. Scharff has a well-illustrated paper 'On the Resemblance of the Flora and Fauna of Ireland to that of the Spanish Peninsula.'

The Little Animals' Friend, a leaflet of eight pages, and sold at one halfpenny monthly by Messrs. Bell and Sons, Ltd., York House, Portugal Street, Lincoln's Inn, contains illustrated animal stories for children.

In *The Entomologist's Record* (Vol. XXIV., No. 1) Mr. Donisthorpe records a beetle new to Britain, viz., *Eryx fairmairei* Reiche. It is similar to *E. ater*, but is more shiny, and has shorter and thinner antennae and legs.

We have received some numbers of a little magazine called *Camping*, the official organ of the Amateur Camping Club. It is issued gratis to members, and is devoted to various matters likely to interest those who delight in camping out.

The Nature Reader Monthly, by F. H. Shoosmith, issued by Charles and Dible, London, is evidently for the use of teachers. The part before us deals with the snowdrop, the wild duck, snow, and the poets and Nature. It contains 32 pages, and is sold at one penny.

We have received No. 28 of Vol. II. of that remarkable bibliography, *The Scientific Roll*, conducted by Mr. Alexandra Ramsay. It deals with 'Vital Chemistry: Lactic Acid.' It is published by Messrs. Dorrington Bros., 111 Farringdon Road, E.C.

Mr. Henry Woods' paper on 'The Evolution of *Inoceramus* in the Cretaceous Period,' appears in the *Quarterly Journal of the Geological Society*, No. 269. It is exceptionally well illustrated. No references are made to the localities from which the specimens were obtained.

In *The Scottish Naturalist*, No. 3, in an article on 'The Primitive Breeds of Sheep in Scotland,' Mr. H. J. Elwes, F.R.S., describes the Manx sheep, which are nearly allied to the Shetland breed. The Manx sheep are said to be the smallest breed in Britain, and have an average dead weight of 20 lbs.

YORKSHIRE BRYOLOGISTS AT PATELEY BRIDGE.

The geological change from the Magnesian Limestone at Knaresbro' to the millstone grits of Pateley Bridge is not more complete than the change in the moss and hepatic associations of the two districts; none of the mosses noted in the report of the Knaresbro' meeting were seen here, and the dominant species were entirely different.

The romantic Raven's Gill was first investigated, and mosses such as *Cynodontium bruntoni* and *Tetraphis browniana* were seen for the first time by many of the party, *Tetraphis pellucida* was found fruiting, and the uncommon hepatics *Cephalozia curvifolia* and *Jubula hutchinsia* obtained. On the rocks in the stream a distinct variety of *Eurhynchium myusoroides*, called *rivulare* brought out discussion, and on the damp banks, masses of *Pterogophyllum lucens* were gathered.

On the way to Guy's Cliff a find was made of *Schistostega osmundacea*, the weird, golden green, apparent phosphorescence from the protonema of this moss in the dark crevices, has always been a 'will o' the wisp' to the mossman, and at last it was to be seen. The effect is a very curious one, almost as if light shone on it from the back of the crevice; many of these places seemed to be used as burrows by the rabbits, which confirmed, in some measure, the idea that these animals are responsible for its distribution.

Next, *Ditrichum homomallum* was found, and then Guy's Cliff reached. On the rocks and cliffs here some of the larger hepatics, as *Mylia taylori* and *Bazzania trilobata* grow, and also the delicate *Lepidozia pinnata*. The moss association of these rocks is dominated by the *Dicranaceæ* group, *D. fuscescens* and its variety *Falcifolium*. *D. majus*, *D. scoparium* and *Campylopus flexuosus* with a little *Dicranodontium longirostre*. The *Plagiothecium elegans* was frequent, and its variety *collinum* raised hopes of some rarer treasure.

The party returned to Harrogate for tea, and afterwards the time allowed by the depleted train service was used in examining a series of microscopic mounts of the peristomes of mosses, made by Mr. R. Barnes. A very cordial vote of thanks was passed to Mr. Yorke, for the permission he accorded the Section to visit his estate.

C. A. Cheeeham.

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BIRDS.

Shags inland in January. -On January 25th, a large bird was noticed flying about over Manningham Mills, Bradford, and later, descended to try its luck on the goldfish in the mill dam. Two days later it was caught in a workshop by Mr. Knight, and was given to Mr. Garnett, in rather a weak state; dying the following day. It was at first reported to be a Black Swan, and afterwards as a Cormorant. The bird has been preserved, and I have just had an opportunity of examining it. It is an immature Shag, but is mounted in a rather un-shag-like attitude, and with very blue eyes! As Shags are of unusual occurrence inland (this one being an addition to our list of local birds) this January movement inland is noteworthy. Their appearance preceded, by a few days, an exceedingly severe spell of almost Arctic weather.—H. B. Booth, Ben Rhydding.

SOME NEW BOOKS.

Small Greenhouses, by **T. W. Sanders, F.L.S.,** (29 Long Acre, W.C.) is number 35 of the useful penny publications issued by the London Agricultural and Horticultural Association.

The Night-Skies of a Year, by **Joseph H. Elgie, F.R.A.S.** Leeds: Chorley & Pickersgill. 247 pp.

This excellent book is written in non-technical language, and is illustrated by over a hundred diagrams. The author, whose contributions to the *Yorkshire Post* are well known, has adopted the novel plan of describing the constellations month by month, as he has observed them in the vicinity of a large Yorkshire city. With this book in hand even a beginner can get much useful information in reference to the stars, and doubtless will, at the same time, catch some of the author's enthusiasm.

Who's Who in Science (International), Edited by H. H. Stephenson. London: J. and A. Churchill. 323 pp., 6/- net.

As might be judged from the title, this is a carefully compiled list of the principal scientific workers of the world, arranged in alphabetical order, and under each name appears particulars of his or her work. It is based on the lines of *the* Who's Who, but contains much information not available in that work. In addition, there is an obituary list for the past year, a list of the world's universities, etc. Amongst the biographies there are some names we did not expect to see, and also, there are not some names we did expect. But apparently this is inevitable in a work of this kind. It has certainly been carefully and conscientiously compiled, and the book is by no means dear at six shillings.

A Naturalist on Desert Islands, by **Percy R. Lowe.** Witherby & Co. 230 pp., 7s. 6d. net.

From this firm we usually expect a book to be interesting, original, and well printed on good paper, and in each respect we are not disappointed. The author had an unrivalled opportunity of visiting many of the out-of-the-way islands in the Caribbean Sea and Gulf of Mexico, during six winters, whilst on board Sir Frederic Johnstone's yacht. Whilst many islands were visited which might well have done duty for a Robinson Crusoe, the author is able to give no account of shipwrecks, adventures, struggles with natives, or desperate straits. But the book is a charming narrative of the wild and natural animal and plant life met with upon these islands, which have not as yet been 'improved' by civilised man. The birds and fishes especially interested the author, who gives particulars of many rare forms. The story is a fascinating one, and particularly appeals to a naturalist. There are thirty-two excellent plates.

Byways in British Archaeology, by **W. Johnson.** Cambridge University Press, 1912. 529 pp., 10/6 net.

Mr. Johnson's work has always a delightful freshness. He traverses untrodden fields, and is remarkably up-to-date in his information. From the numerous references and footnotes it is apparent that he has drawn from an incredibly large number of books and periodicals for the facts upon which he bases his narrative. The present work is equally interesting to antiquary or naturalist, and has chapters on 'Churches on Pagan Sites'; 'The Secular Uses of the Church Fabric'; 'The Orientation of Churches and Graves'; 'Survivals in Burial Customs'; 'The Folk-lore of the Cardinal points'; 'The Churchyard Yew'; 'The Cult of the Horse'; 'The Labour'd Ox,' and 'Retrospect.' Whilst each chapter is a complete essay in itself, the whole form a connected story. Readers of this journal will find much that will particularly appeal to them, as Mortimer's 'Forty Years' Reaearches,' *The Naturalist*, and other similar sources have supplied information. The chapters dealing with the horse, ox, and yew, are especially valuable to naturalists; though personally we find it difficult to say which are the most interesting.

A Guide to the Fossil Invertebrate Animals in the Department of Geology and Palæontology in the British Museum (Natural History). Second Edition, 8vo, x.+184 pp., seven plates. London, 1911. Price 1/-.

The first edition was published in 1907. In this revised edition the chief alterations and additions are the following :—The omission of an account of the Koenig and Gilbertson Collections (p. 9) owing to the dispersal of the specimens among the systematic series. The addition of the Archæocyathinæ (p. 42). A revised account of the Cirripedia (p. 94). Several alterations due to the re-arrangement of the Brachiopoda (p. 114). An Appendix (p. 117) noting recent additions to the exhibited series of Mollusca. Fig. 41 is an original figure of the under surface of *Eurypterus fischeri*. Fig. 49 is from a new drawing of *Protocarcinus longipes*. Fig. 65A represents a Senonian species of *Membranipora*. In making some of these alterations the author, Dr. F. A. Bather, acknowledges the help of W. T. Calman, R. B. Newton, W. D. Lang, and T. H. Withers. There are many excellent illustrations in this remarkably cheap handbook, and a good index.

A History of Withernsea, by **G. T. J. Miles** and **William Richardson.** Hull : A. Brown & Sons. 286 pp., price 5s.

On the cover of this well-printed and well-bound volume are the words ' A History of Withernsea ' ; on the first page inside, the word ' etc.' in small type, is added ; and on the title this ' etc.' is replaced by ' with notes of other parishes in South Holderness in the East Riding of the County of York ' ; and when we get to the book itself we find that of its 286 pages only 52 refer to Withernsea, and of these many are occupied by ' Lists of Incumbents,' admittedly copied from Poulson's ' Holderness ' ; extracts from Thompson's ' History of Welton,' etc., so that when we come to the History of Withernsea proper it is rather disappointing. Apparently no prehistoric remains are recorded for Withernsea,* and the interesting old views of Withernsea Church in ruins (in Allen's ' Yorkshire '), and Owthorne Church (in Thompson's ' Ocellum Promontorium ') would certainly have been more welcome than, say, the very modern ' Wesleyan Chapel ' facing page 34. The authors, however, appear to be most interested in giving ' Lists of Incumbents,' ' Inscriptions in Churchyards,' and extracts from Registers and Accounts ; these are well enough in their way, but they are not what are nowadays expected as a ' History.' After Withernsea, we find notes on Owthorne, Hollym, Tunstall, Holmpton, Easington, Kilnsea, and Spurn, and fourteen other places, with their Lists of Incumbents, (from Poulson), etc. The frontispiece [illegible] ton Constable Hall, which is miles away, and, judging from the [illegible] not even mentioned in the History. On page 236, under Welwick, is an illustration of some fragments of Roman Pots found at Withernsea, which should have appeared more than 200 pages earlier in the book ; the seal of Hedon comes under 'Sunk Island ' ; whilst here and there spaces have been filled in by the insertion of primitive blocks from poor drawings, most of which obviously have no connection with either Withernsea or any of the numerous other places mentioned in the volume, and some of which are not even described. The book, however, contains reproductions of one or two interesting maps shewing the effect of the ravages of the sea, that of part of ' old Kilnsea Township ' being particularly interesting. Personally we consider that the authors, presumably young men, have been too ambitious, and would have produced a much more valuable work if they had stuck to the place named on the cover.—F.S.A.

Metallurgy, by **W. Borchers.** Translated from the German by **W. T. Hall** and **C. R. Hayward.** London : Chapman & Hall. v. + 271 pp., 12/6 net.

In this excellently illustrated volume the author gives an outline of the

* A few have been figured elsewhere ; one, a fine axe, in this journal.—Ed.

modern processes for extracting and refining the more important metals. Each chapter is clear and succinct, and no space is wasted in fine writing. It is just what the student requires. The value of the book is considerably increased by no fewer than 218 figures, which clearly indicate the various processes in the manufacture of gold, silver, mercury, lead, tin, iron, zinc, manganese, and many other metals.

Wonders of Plant Life. by **S. Leonard Bastin,** with 40 plates and 8 autochromes. Cassell & Co., Ltd., London. pp. x. and 136. 3/6 net.

This book deals in a very readable and interesting manner with the more important phases of plant life, under such headings as :—' The Assertive Plant,' ' The Plant and the Seasons,' ' The Plant as a Host,' ' The Plant and its Helpers and its Enemies,' ' The Feelings of Plants and the Evolution of Flowers.' There are a number of good illustrations from photographs taken by the author ; two of these, one showing aquatic plants in summer, and another showing the same habitat in winter, are very striking. On the whole the book is carefully written ; but occasionally unwarranted statements are made, *e.g.*, ' flowers with sepals and petals but lacking the reproductive process are of course unknown in Nature.' Neuter flowers seem to have been overlooked. Fruits are often called ' seeds,' and ' leaf ' is sometimes used in the sense of shoot and thallus.

The World's Minerals, by **Leonard J. Spencer, M.A., F.G.S.** London : W. & R. Chambers. x.+212 pp.

The greatest difficulty that beginners have experienced in the study of minerals by means of text-books is that it has been hitherto impossible to convey any proper idea of the actual appearance of the minerals by diagrams and descriptions. In the present work this difficulty has been practically overcome. By means of 40 coloured plates, the character of our chief minerals is shewn in a way we do not remember to have seen in a text-book previously. Not only are the varied and beautiful colours faithfully represented, but even the lustres and metallic tints are reproduced. Some of the reproductions are wonderfully well done—the Flourspar (plate 9), and Quartz (plate 11), particularly appeal to us. The name of Mr. L. J. Spencer, of the Mineralogical Department, British Museum, and editor of the Mineralogical Magazine, is a sufficient guarantee of the character of the descriptive letterpress, and he has not made the mistake of including too many. He principally confines the book to a description of 116 more common simple minerals, and these are illustrated by 163 figures on the coloured plates. Particulars are given of the localities at which the minerals occur, etc.

The Fur, Feather and Fin Series. This well-known series will certainly be familiar to most of our readers, but our present purpose is to draw attention to the fact that the publishers, Messrs. Longmans, Green & Co., have just issued a cheap impression at half-a-crown a volume. As the volumes are well bound and illustrated, anyone interested in the sporting side of natural history should certainly obtain them. The books are divided into sections to suit the tastes of different classes of readers. For instance, that devoted to **The Pheasant** has a natural history section by the Rev. H. A. Macpherson ; ' shooting ' is by A. J. Stuart-Wortley, and ' cooking ' by Alexander Innes Shand. **' The Grouse '** and **' The Partridge '** volumes are similarly dealt with. In the case of that on **The Hare,** besides the Rev. Macpherson's notes on natural history, the Hon. Gerald Lascelles writes on ' shooting,' Mr. C. Richardson on ' coursing,' Messrs. Gibbons and Longman on ' hunting,' and Col. Kenney Herbert on ' cookery.' Personally, we find the volume dealing with **The Red Deer** of the most general interest, though they are all well worthy of careful study. The publishers kindly enable us to reproduce one of the illustrations from the last-named book (see plate IV.), which will give a fair idea of the nature of the illustrations.

PROCEEDINGS OF PROVINCIAL SCIENTIFIC SOCIETIES.

Part XIII., Vol. II. of the **Transactions of the Yorkshire Dialect Society** contains a paper by Dr. W. A. Cragie on 'The Revival of Languages and Dialects,' and one on 'Place Names and Dialect Study,' by Mr. H. Alexander.

Transactions and Proceedings of the Perthshire Society of Natural Science, Vol. V., part 3. This part contains Mr. J. Menzies' paper on 'Some Discomycetes of the Locality and their habits'; Dr. J. P. Sturrock's address on 'Modern Aspects of Eugenics'; Mr. G. F. Bates' 'Notes on Some Highland Rocks'; a full report of the society's meetings, and Mr. Rodger's carefully prepared meteorological observations. There are several plates.

Vol. I., part 2 of the **Yorkshire Numismatic Fellowship** (Hull: A. Brown and Sons, 1/-) contains a summary of the Society's proceedings, an account of the Spurn Lighthouse Token, the Calverley Token, Regal Coins struck at York, Unpublished Yorkshire XVII. century tokens, a new Halifax token, a new Hull medal, and York pennies of Edward the Confessor. The contributors are Messrs. Sykes, Pickersgill, Sheppard, Hamer and Wilkinson. There are several plates and other illustrations.

The Burton-on-Trent Natural History and Archaeological Society has recently issued its Transactions, Vol. VI., for sessions 1906-7-8-9-10 (LIII. + 100 pp.). They contain reports of the society's meetings, list of members, photographs of past presidents, etc., the last-named being referred to in an article entitled 'Olim inter nos primi: nunc eheu! Decessi; nunquam obliti.' There are papers dealing with Herbert Spencer; New Zealand Plants; Sen Mut, an Egyptian Crichton; 'The Influence of the East on European History'; the English Novel, and Sinai Park. Some, however, are of more local interest, viz., 'Noted Oaks near Burton,' and the '"Breaking" of Barton Fishpond,' by J. E. Nowers; 'the Cannock Chase Coalfield,' by G. M. Cockin; 'the Annals of Burton Abbey,' by R. T. Robinson; 'Local Natural History Observations,' by C. G. Matthews; 'the Abbots of Burton Abbey,' by G. Appleby; 'Dates of Arrival of Summer Migrants,' by C. Hanson; and a meteorological summary for the five years, supplied by Dr. J. M. Cowie. There are a number of illustrations, those of the large oaks being of particular interest (see plate V). We do not know what has been the editor's object in changing the colour of the cover; and the omission of the lettering on the back is certainly a disadvantage. The 'black' type used here and there in the text is much too large.

The Proceedings of the Yorkshire Geological Society, Vol. XVII., part 3, for 1911, were issued on January 30th, as stated on the cover, and form quite a good number. It contains Prof. Kendall's Presidential Address, dealing with the progress in Yorkshire geology during the past half century; Mr. L. Richardson describes the Lower Oolites of Yorkshire, and his paper has appendices by Messrs. Buckman and Paris; Mr. G. W. Lamplugh has an admirably illustrated paper on Spitsbergen Glacial Phenomena, which is of particular value to British glacialists, and easily bursts Prof. Bonney's Sheffield bubble. Dr. A. Wilmore describes the zones of the Carboniferous Limestone south of the Craven Faults, and Mr. J. W. Stather demonstrates the way in which the belemnites of the Yorkshire Chalk vary in form as they occur in ascending order, a paper which shews that the question 'What is a Species?' is not easy to answer. Dr. A. Vaughan figures and describes a new coral from Ingleton, under the name of *Clisiophyllum ingletonense*. There are also obituary notices of J. R. Mortimer and E. M. Cole. by Mr. Lamplugh and Mr. Sheppard respectively. There is the annual report, and the financial statement, both of which are satisfactory, but the printers have so frightfully guillotined this part, resulting in it being considerably shorter than any of the parts that have been issued during the past seventy years, that the volume for 1911 will for ever be an eyesore on our shelves.

NEWS FROM THE MAGAZINES.

We learn from the *Museums Journal* that a prehistoric boat, 18 feet long, dug up near Nantwich, has been deposited in the Chester Museum. To the January number of this journal, Mr. E. Rimbault Dibden, of the Walker Art Gallery, Liverpool, writes a useful paper on 'The Functions of a Municipal Art Museum.'

In *British Birds* for February, one article is headed 'Three New British Birds.' Surely this 'New British Bird' business is becoming a farce. The other day an ornithological correspondent sent us an account of an escaped parrot, as a 'New British Bird'; but we treated the matter as a joke; apparently we ought to have sent the record to our London contemporary.

The Nature Photographer, the official organ of the Nature Photographic Society, is issued quarterly, at twopence, and is edited by Mr. Carl Edwards. It contains illustrated notes on Marauding Gulls, Stereoscopic Photography with an ordinary camera, the Angry Coot, Some Confident Sitters, and Our Book Shelf. The little magazine is evidently intended for nature photographers.

In *The Entomologist*, No. 586, Mr. W. Mansbridge describes two new varieties of lepidoptera, as a result of his crossing experiments, and as the varieties are 'permanent and recurrent and found in a wild state,' he proposes new names, and he christens them *Boarmia repandata* var. nov. *Nigro-pallida*, and *Boarmia repandata* var. nov. *Ochro-nigra*. Oddly enough, these new forms are in the author's own cabinet.

In the *Geological Magazine* (No. 572) is an illustrated paper on the 'Tachylite of the Cleveland Dyke,' by Miss M. K. Heslop and Mr. R. C. Burton, and a note on the Fossil Flora of the Ingleton Coalfield, by Mr. E. A. Newell Arber. In the latter it is pointed out that the Ingleton coalfield contains a typical middle coal-measure assemblage, and as a whole, the Ingleton coal-measures seem to be closely related to the Yorkshire coalfield.

British Birds for March does not contain a paper on a New British Bird. This is an improvement. We were going to suggest to Mr. Witherby that the name of his magazine should be changed to *New British Birds*. The March number contains particulars of the various localities at which the Little Auk has been recorded recently; and Mr. Mullens reprints his paper on Thomas Muffett or Muffet (one form of spelling being given in the paper, and the other in the 'contents').

The January number of the *Bradford Scientific Journal* includes a paper on 'Fish Poisoning in the Wharfe,' a subject we have referred to in our pages; the House Martin, Vertebrate Zoology report, an avian paradise, the Lesser Shrew, and 'Memories of the North,' by Messrs. Bolam, Butterfield, H. B. Booth, Harper, and Badland. Typographically, we would suggest an improvement would be made if instead of the frequent large AB's at the end of some of the notes, the type used were similar to that for the authors of other notes in the journal, *viz.*, 'F. Haxby,' on page 205.

The Zoologist (No. 848) contains particulars of recent additions to the Lincolnshire avi-fauna, by the Rev. F. L. Blathwayt. They are the Fire-crested Wren, the Lanceolated Warbler, Bearded Titmouse, Willow Tit, Red Breasted Flycatcher, Snowy Owl, Eagle Owl, Montagu's Harrier, Iceland Falcon, American Peregrine Falcon, Red-footed Falcon, Red-crested Pochard, Pratincole, Black-winged Stilt, Buff-breasted Sandpiper, Caspian Tern, and Great Shearwater. Some of these were described at the time in *The Naturalist*. In the same journal Mr. G. Dalgliesh has a paper on the Whirligig Beetle.

NORTHERN NEWS.

A fine long-tailed duck was 'obtained' on Filey Brig on February 16th.

Mr. Joshua Fountain, of Filey, who keeps tame gulls, is retiring from business.

For the loan of the portrait of Canon Fowler (Plate II.) we are indebted to the Lincolnshire Naturalists' Union.

The Geological Society has divided the Lyell Fund between Dr. A. R. Dwerryhouse and Mr. R. H. Rastall.

Messrs. H. B. Booth (Ben Rhydding) and G. A. Booth (Preston) have recently been admitted as Fellows of the Zoological Society.

From a recent report of a Yorkshire museum we learn that 'the main collection of eggs is housed in the drawers under the bird *cages*!'

At a recent meeting of the Yorkshire Numismatic Fellowship, a society devoted to the study and acquisition of money and medals, Mr. T. Sheppard was elected President. Oddly enough, the previous President was Mr. William Sykes!

In a 'nature magazine' a Middlesborough correspondent tells of a dog that 'died in the most horrible convulsions' at the feet of a violin player who *would* play to the dog. What would have happened had it heard the Filey trumpet?

Another way of 'marking' birds. We learn from the weekly press, under the head of 'Holme on Spalding Moor,' that 'a crow, with bell attached, has been seen and heard during the week flying over Holme Common. If he should happen to see it, this item of news will interest the person who fixed the bell.'

The Filey launchers recently went on strike, but the matter was amicably settled by an extra crab. For helping to launch the fishing boats each man has hitherto received one fish or two crabs. In future they will receive one fish or three crabs. Thus has a national strike of cobble launchers been averted by allowing one extra crab per man per launch!

The late G. H. Verrall has left his collection of British Diptera, and the cabinets in which it is contained, to his nephew, J. E. Collin, conditionally upon his offering to the British Museum three pairs of each species of which he possessed a full series, *i.e.*, six pairs. He has also left all his real and personal estate in the parish of Wicken, Cambridgeshire, to the National Trust for Places of Historic Interest or Natural Beauty.

The following is a fair example of the news in our daily papers during the cold weather a little while ago :—'RARE BIRDS SHOT.—During the last few days some rare birds have been shot at Hull, including mallards and large and small grebe. *While two sportsmen were shooting at Marfleet, Hull, a large bird appeared on the horizon. It fell to two shot of the sportsmen, and was found to be a splendid specimen of the cormorant.*' Another "sportsman" shot a "pooker," and another got a "puttin."

For the meeting of the British Association for the Advancement of Science, which is to take place at Dundee on September 4th and following days, under the presidency of Dr. E. A. Schäfer, F.R.S., the following presidents have been appointed to the various sections :—Mathematical and Physical Science, Professor H. L. Callendar, F.R.S.; Chemistry, Professor A. Senier; Geology, B. N. Peach, F.R.S.; Zoology, Dr. P. Chalmers Mitchell, F.R.S.; Geography, Sir Charles M. Watson, K.C.M.G.; Economic Science and Statistics, Sir Henry H. Cunynghame, K.C.B.; Engineering, Professor A. Barr; Anthropology, Professor G. Elliot Smith, F.R.S.; Physiology, Leonard Hill, F.R.S.; Botany, Professor F. Keeble; Educational Science, Professor J. Adams; Agriculture, T. H. Middleton. Agriculture will form the subject of a full section for the first time. Professor W. H. Bragg, F.R.S., and Professor A. Keith, M.D., have been appointed to deliver the evening discourses.

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NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY
T. SHEPPARD, F.G.S., F.R.G.S., F.S.A.Scot.,
THE MUSEUMS, HULL;
AND
T. W. WOODHEAD, Ph.D., F.L.S.,
TECHNICAL COLLEGE, HUDDERSFIELD.
WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
J. GILBERT BAKER, F.R.S. F.L.S., GEO. T. PORRITT, F.L.S., F.E.S.,
Prof. P. F. KENDALL, M.Sc., F.G.S., JOHN W. TAYLOR,
T. H. NELSON, M.B.O.U., WILLIAM WEST, F.L.S.,
RILEY FORTUNE, F.Z.S.

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THE NATURALIST. A Monthly Illustrated Journal of Natural History for the North of England. Edited by T. SHEPPARD, F.G.S., Museum, Hull; and T. W. WOODHEAD, F.L.S., Technical College, Huddersfield; with the assistance as referees in Special Departments of J. GILBERT BAKER, F.R.S., F.L.S., PROF. PERCY F. KENDALL, M.Sc., F.G.S., T. H. NELSON, M.B.O.U., GEO. T. PORRITT, F.L.S., F.E.S., JOHN W. TAYLOR, WILLIAM WEST, F.L.S., and R. FORTUNE, F.Z.S. (Annual Subscription, payable in advance, **6/6** post free).

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All communications respecting 'The Naturalist' and publications should be addressed to T. Sheppard, F.G.S., The Museum, Hull; and enquiries respecting the Yorkshire Naturalists' Union should be addressed to the Hon. Secretaries, Technical College, Huddersfield.

NOTES AND COMMENTS.

FOREIGN BIRDS IN BRITAIN.

Mr. Hugh Boyd Watt, in *Knowledge* for April, summarises the records which exist of the casual appearance of foreign birds in this country. Many supposed visitors have escaped from private grounds: a Penguin, which was found walking along in Baker Street, came from the Zoo; other birds have been let out accidentally or turned loose from ship-wrecked vessels, while others again are the result of attempts at acclimatisation, which have been made from time to time by bird-lovers in this country. We quite agree with Mr. Watt that, of the two hundred and seven species of casuals, or occasional visitors, now on the 'British' list, a large number have the most slender claims to be called British.

THE GREAT AUK.

With the above title Mr. Thomas Parkin, M.A., F.Z.S., has issued a very useful and well-illustrated account of the numerous sales of Great Auk skins and eggs during the past century. Naturalists will be grateful to the author for the care he has exercised in placing upon record the facts connected with the history of the various specimens, some of which are quite romantic. For instance, some years ago ten eggs of the Great Auk were found by Prof. Newton in the museum of the Royal College of Surgeons. There was no history attached to them, and no one knew how they had got there. Three were retained by the museum, three passed in to the possession of Mr. Robert Champney, of Scarborough, where they have been seen by many of our members, and the other four were sold. It is interesting to notice, too, that in the 'fifties,' Great Auk's eggs were bought from prices varying from £20 to £30. In recent years a number has been sold for over £300 each. We are kindly permitted to reproduce one of the illustrations (Plate XII.). The booklet can be obtained from the author at Fairseat, High Wickham, Hastings, for two shillings.

THE IPSWICH SKELETON.

Considerable discussion has taken place in the press and elsewhere in reference to a so-called pre-boulder-clay human skeleton, found a little while ago near Ipswich, and, oddly enough, the name of a prominent naturalist appeared in the daily papers at the foot of an article supporting its age and authenticity. As a rule, however, we find it safer to await a carefully prepared description, written in cooler moments, in the pages of some journal of scientific standing. And we must say in these matters we are inclined to accept the opinion of a geologist rather than that of an antiquary, as the authenticity of a pre-boulder-clay man must necessarily be supported by geological evidence.

GLACIAL AGE NOT PROVEN.

In the *Geological Magazine* Mr. G. Slater, F.G.S., carefully reviews the geological evidence, and concludes that the skeleton is ' of doubtful age.' The general section in the side of the pit where the remains were discovered ' is extremely unsatisfactory.' One report by the persons who excavated the skeleton says ' the section of decalcified boulder clay ' occurred *underneath the bones,* and in another part of the same report by the same gentlemen, it is stated that ' the bones were lying *partly embedded in glacial sand and partly in decalcified clay.*' The latter is confirmed by the bones themselves, and in view of the different origins of stratified sand and boulder clay, it is difficult to see how the skeleton should be partly embedded in each, if contemporaneous with either the one or the other.

A CAST OF THE SKULL.

Those in favour of the glacial age of the remains attach much importance to the fact that a complete cast of the inside of the skull was found, of the same material as the surrounding clay. It is even considered that ' the clay was in a semi-fluid state at or since the time the remains were embedded in it.' Those who have had any experience in digging in graveyards, whether they be comparatively modern, or of Saxon, Roman or Neolithic age, know quite well that it is by no means an uncommon occurrence for a skull to be tightly packed with soil or other material, which has been drawn in by percolating water, worms, etc. And what more natural than it should be the same as the surrounding soil ? It would indeed be strange if this were not so. As regards the bones themselves, these bore no signs of great antiquity, either in their shape or substance. They were not at all mineralised ; in fact were extremely light. In view of all the circumstances, therefore, it seems clear that a pre-boulder-clay man has still to be found in Britain.

THE DIVINING ROD.

The United States Geological Survey, which has issued so many valuable memoirs bearing upon different aspects of water supply, has recently published a paper dealing with the question of the utility of the divining rod for finding water. It is stated that ' the uselessness of the divining rod is indicated by the fact that it may be worked at will by the operator, that he fails to detect strong water-current in tunnels and other channels that afford no surface indications of water, and that his locations in limestone regions where water flows in well defined channels are no more successful than those dependent on mere guesses. In fact, its operators are successful only in regions in which ground water occurs in a definite sheet in porous material or in more or less clayey deposits . . . No appliance has yet been devised that will detect water in places where plain commonsense will not show its presence just as well.'

THE POST OFFICE AND NATURAL HISTORY SPECIMENS.

Recently we received the torn half of a foolscap envelope from a contributor at Halifax, and it contained a letter to the effect that there were some natural history specimens enclosed. The Post Office authorities had written across the envelope that it was torn on arrival at Hull. We at once wrote to the Hull office, enclosing the portion delivered, and offering it in exchange for the part kept. Two days later we received a form (marked R.L.B.—No. 29. G. & S., 4112. 750/7/09—[9358] 750 2/10v) from the Postmaster at *Manchester*, enclosing the empty tin tobacco box that had contained the specimens, with the information that the contents had been destroyed the day they were received at Hull 'in accordance with the regulations of the Department [with a capital 'D'] relating to the disposal of perishable, offensive or injurious articles.'

THE LAW AND NATURAL HISTORY SPECIMENS.

There was a further notification to the effect that 'it is contrary to law to forward by post anything likely to injure the contents of the mails, or the officers of the Post Office.' As the specimens had been preserved in formalin, were quite hard, dry, and without smell, it is difficult to see why they should so promptly have been taken from the tin box, together with the cotton wool in which they were wrapped, and destroyed. Why the Postmaster at Hull sent the empty tin box to the Post master at Manchester, in order that it might be returned to us at Hull, is a problem we shall not attempt to solve, unless it is that there is a mutual understanding amongst the 'Officers of the Post Office' that this sort of thing shall be done in order to prevent their 'injury,' as mentioned on the form R.L.B.—No. 29. G. & S., etc., etc. In justice to the Post Office, we ought to say that we were not asked to pay extra postage on the tobacco box which they had emptied.

THE SOUTH KENSINGTON MUSEUM.

In view of the interest taken in the question of the site of the South Kensington Museum by the members of the Yorkshire Naturalists' Union, we have pleasure in giving the following copy of a letter from the South Kensington Museum, dated March 19th, addressed to the Secretary of the Union:—

'A settlement of the question of the allocation of the South Kensington site on the north of the Natural History Museum buildings has now been arrived at with His Majesty's Government and the Public Departments concerned, and having regard to the friendly interest taken by the Yorkshire Naturalists' Union, in this matter, I am directed to acquaint you, for the information of the societies affiliated to the Union

that by the terms of that settlement, the northern boundary of the Natural History Museum as fixed in 1899, will be maintained, and the land to the south of it will be available for the extension of the Museum.'

THE PALÆONTOGRAPHICAL SOCIETY.

The annual volume issued by this society came to hand on March 9th, a rather later date than usual. The Committee deplore the loss of a number of members by death, and an urgent appeal is made for new members. In view of the extraordinary work being done by this society, and in view of the fact that the contributors to its volumes give their services, we sincerely trust that all our readers who are able will send their names (and guinea cheques) to the Secretary, Dr. A. Smith Woodward, of the Natural History Department of the British Museum, South Kensington. In return each subscriber will receive a volume worth much more than the guinea, containing monographs dealing with various phases of palæontology, by the greatest living authorities on the respective subjects. The Palæontographical Society does not clash with the Geological Society in any way, but rather supplements it in its work.

FOSSIL MAMMALS.

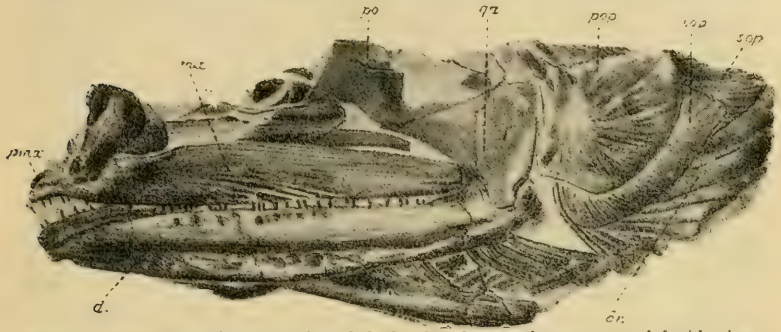
The first monograph in the recently issued Volume LXV. deals with the 'Pleistocene Mammalia: Mustelidae,' and is by Prof. S. H. Reynolds, of Bristol. The present instalment deals with the fossil Pine Marten, Giant Polecat, Polecat, Stoat, Weasel, Glutton, Badger and Otter, Reference is made to the various localities (including Yorkshire, Lancashire, etc.), from which remains of these animals have been obtained. But in our opinion the part of this work that will principally appeal to the naturalist is that which illustrates the skulls, teeth and bones of the various species referred to. There are scores of these illustrations, and each one is exceedingly well done.

GANOID FISHES.

Dr. Ramsay H. Traquair follows with a further instalment of his remarkable monograph on the ganoid (or armour clad), fishes. The present contribution deals with the Palæoniscidae, and in this section Dr. Traquair illustrates some wonderfully preserved fossil forms, most of which are from Scotland. Additional value is added to his notes from the restorations of the various species, which he gives. For some reason or other the plates accompanying Dr. Traquair's monograph are printed on tinted paper, which does not seem to harmonise with the volume. There is doubtless some reason for this, though it is not apparent, unless it is to shew that the plates are paid for by the Carnegie Trust for the Universities of Scotland, though this is clearly stated in each case, as well as in the introductory remarks.

FOSSIL FISHES OF THE CHALK.

The Secretary of the Society, Dr. A. Smith Woodward, gives a further section of his magnificent work on the Fossil Fishes of the Chalk. This is illustrated by a wonderful set of plates shewing the palate teeth and other remains of fishes, many of which are from Lincolnshire and other northern localities. He also figures and describes a fine skull of possibly a new form of Pachyrhizodus, from the zone of *Holaster subglobo-*



Pachyrhizodus sp.; lower portion of the head and opercular apparatus, left side view, nat. size. Zone of *Holaster subglobosus*; South Ferriby, Lincs. Collected by Mr. H. C. Drake, F.G.S. Now in the Hull Museum.

br = branchiostegal rays; *d* = dentary; *iop* = interoperculum; *mx* = maxilla; *pmx* = premaxilla; *po*=postorbital plate; *pop*=preoperculum; *qu*=quadrate; *sop*=suboperculum.

sus at South Ferriby. This was obtained by Mr. H. C. Drake, and is now in the museum at Hull. By the kind permission of the Palæontographical Society, we are able to give an illustration of this interesting specimen. Fish remains, of course, are not at all common in the northern chalk. Dr. Woodward also refers to the rostrum of a species recently described as *Protosphyraena stebbingi*, which Mr. T. Sheppard obtained from the same locality. This specimen is more complete than the type specimen, and Dr. Woodward kindly promises to describe it shortly in *The Naturalist*.

FOSSIL CHALK INOCERAMI.

Mr. Henry Woods has a further instalment of his work on the Cretaceous Lamellibranchiata, and in the present volume deals exhaustively with those exceedingly difficult fossils, the *Inocerami*. These oyster-like shells, from the enormous way in which individuals of each species vary, have always been one of the most difficult of the forms of fossils with which a student and collector has had to deal; and hitherto the lack of a detailed monograph dealing with the genus has resulted in many workers throwing the subject up in despair. In future, by reference to this monograph, the study will be comparatively simple. Mr. Woods describes a number of new forms, and we are glad to see that Yorkshire has provided much material for his work. A figure of one specimen, from the Upper Chalk of Yorkshire, we are kindly permitted to reproduce (Plate XIII.).

SHELLY CLAY FROM THE DOGGER BANK.

J. W. STATHER, F.G.S.

In the *Essex Naturalist* for Apl., 1909, Mr. Clement Reid, F.R.S., had a paper on 'Moorlog,' a name given to a peculiar tough, peat-like deposit, which is occasionally dredged up from the Dogger Bank. Recently I arranged with the captain of a Hull trawler to bring me any samples that came into his net. The material occurs in huge cake-like masses, which are sometimes as much as a foot in thickness, and these contain remains of aquatic and marsh-loving plants, such as the Buckbean (*Menyanthes trifoliata*), etc. One mass, however, was found to contain a quantity of unquestionably marine shells. This piece was a compact clay, and dark in colour, being almost lead-black. In it were crushed and partly decayed marine shells, in large quantities. Apparently the darker clay occurs beneath the peat. On sending some of it to Mr. Clement Reid, he kindly pointed out that the shells are typical of very shoal water, and must have flourished when the Dogger, at that point, was practically at present land-level. This being so, it is probable our ideas as to the former history of the North Sea basin will have to be considerably modified. The subject, however, is being followed up, and no doubt interesting results will be obtained.

From Belfast we have received two publications. One is Publication No. 31 of the **Belfast Municipal Museum,** and the other is Publication No. 31 of the **Belfast Public Museum.** As a matter of fact, they are both from the same institution, and, apparently, one should have been numbered 30. One is the illustrated Quarterly Record, and the other is a paper by Dr. Scharff, on 'The Aims and Scope of a Provincial Museum,' which is well worth reading.

From the Norwich museum we have received the **Report of the Castle Museum Committee for 1911,** which contains a large list of acquisitions. Visits of scholars and societies have been frequent. The museum has also published a **Catalogue of the Loan Collection of Norwich Silver Plate, etc.,** which includes details of many objects of altogether exceptional interest; and the **Fourth Annual Report of Proceedings of the Norwich Museum Association.** This association works with the museum, popularises the collections, and arranges lectures dealing with the economic aspect of various branches of natural history; in this way considerably extending the museum's sphere of usefulness.

From the Kelvingrove Museum, Glasgow, we have received an **Introduction to the Study of Fossils and Guide to the Palæontological Collections,** by **Peter MacNair** (89 pp., 3d.). As the guide naturally refers to the Glasgow collections, which are largely of local interest, the handbook may be said to form a good summary of the palaeontological remains of the Glasgow area. It is divided into sections, according to the geological systems, and is well illustrated from drawings and photographs, though some of the former, such as the Nautilus, page 38, and the phyllopod on page 53, are not quite satisfactory.

A METHOD OF REMOVING TESTS FROM FOSSILS.

S. S. BUCKMAN, F.G.S.

The following remarks apply especially to brachiopods; but there is reason to believe that the method may be extended with advantage to other classes of fossils. Among brachiopods natural casts are not frequently met with, except in a few favoured localities; and the natural casts are often unsatisfactory. Therefore a method of making artificial casts by removal of the tests becomes of value when it is desired to study internal characters. The following is the method:

Choose specimens which are not crystalline, and preferably those which are likely to have a close-grained,* hard internal core. Heat them to redness and then drop into water. Much of the test will then fall off; what remains can sometimes be wholly removed by brushing. If not, the delicate use of a sharp penknife will separate the rest. Care must be employed in using the penknife to prevent scratching of details of muscle marks, ovarian area, or vascular markings.

Heating may be done in the ordinary fire, but it is not altogether satisfactory; the specimens may be burnt too much. Heating by means of a bunsen flame, or a spirit lamp, or for larger specimens a gas or spirit blow-lamp, is more satisfactory. As the test is more adherent over the muscle areas, they should be heated most; that is, the specimens should be held beak downwards in the flame in the case of brachiopods.

Experiments so far have been chiefly with Mesozoic brachiopods, and of these the Rhynchonellids come out most satisfactorily, presumably on account of their fibrous test: some of them make very beautiful casts, showing all details excellently, but, of course, much depends on the state of fossilization. The Dallininæ have also yielded satisfactory results, but for some reason the Terebratulids do not come out so well, and the proportion of spoilt specimens is considerable.

In the case of rare specimens, the method should only be enployed after careful consideration: there is, of course, a risk of destroying the specimen altogether; and in any case details

* When this note originally appeared, in the 'American Journal of Science,' XXXII. 163, Aug. 1911, the epithet 'close-grained' was printed 'coarse-grained' by some accident, and I did not see any proof. However, it is obvious that a coarse-grained core is the last thing that would be desirable. A hard core has a grain of close and fine texture, and that is what is required. A coarse-grained core is the sort of thing met with in some of the Lower Oolites, where the rocks are truly oolitic; and such a core, if it does not crumble away when heated, will yield no muscle-impressions of any value. A coarse-grained core is found in fossils from some of the siliceous sands, like the Greensand: it may be coarse-grained and incoherent, so that on the removal of test everything crumbles away. But calcareous sands, and also clays, often yield specimens (Brachiopods) with good cores of close texture.—*Note by Author, March* 1912.

1912 May 1.

of test, of beak, deltidial plates, etc., will be lost. The method was suggested by receiving, for description, from the Geological Survey of India, a series of brachiopods from Burma, which had been burnt by Mr. T. D. La Touche for the purpose of extracting them from a rather intractable matrix. Many showed as a consequence good internal details, and that fact suggested burning other species to compare with them.

——: o :——

BIRDS.

Jackdaws occupying Magpie's Nest.—A pair of Magpies built a nest this month in a Sycamore Tree, near Harrogate. The eggs were taken. A pair of Jackdaws have now occupied the nest. I have never known a similar case. Several pairs have built in some small square open chimney pots, about 12 inches high, in Grosvenor Terrace. The nests are quite open. These pots have now been occupied for some years, and the birds never leave the locality, but are about in pairs throughout the winter.—R. FORTUNE, April, 1912.

Farne Islands Association.—Mr. Paynter in his Annual Report states that 1911 was a very good breeding season for the various species of birds nesting on the Farnes. The weather was dry and warm, with the exception of the 24th and 25th of June, when is was exceedingly cold and wet ; this caused the death of a great many young Puffins and also a few young Arctic Terns by drowning. It is satisfactory to learn that the Sandwich Terns did not suffer. The Arctic and Sandwich Terns were breeding on the Knoxe's, and Inner Wideopens, in enormous numbers ; they have increased greatly during the last few years.

Many attempts were made in the early part of the season, on foggy nights, to raid the breeding grounds of the Terns, without, we are glad to say, any success ; but the watchers had a very anxious time.

Eider Ducks, Puffins, Guillemots, etc., were as numerous as ever, and a few Razorbills bred as usual on the outer Wideopens. These birds do not increase, owing no doubt to the lack of suitable sites, as they do not care to deposit their eggs on the open ledges like the Guillemot. It is interesting to note that a pair of Common Gulls were again constantly seen during the breeding season. The nest, however, was not located.

The protection of these islands is not done without considerable expense, and over £100 is expended annually in watching them. This is all subscribed voluntarily. I notice the names of four members of the Yorkshire Naturalists' Union in the subscription list, and, no doubt, Mr. Paynter will be glad to have more. If any of our members care to send a subscription, his address is 'Freelands,' Alnwick.—R. FORTUNE.

CARPOPHILUS SEXPUSTULATUS F., ITS CONGENERS, AND THEIR OCCURRENCE IN THE BRITISH ISLES.

E. G. BAYFORD, F.E.S.

INCLUDING a specimen of *C. obsoletus* Er. recently taken in Edlington Wood by Mr. W. E. Sharp, F.E.S., six species of the genus have at various times been recorded as occurring in the British Isles.

These are 1. *C. hemipterus* L.
2. *C. bipustulatus* Er.
3. *C. obsoletus* Er.
4. *C. mutilatus* Er.
5. *C. dimidiatus* Er.
6. *C. sexpustulatus* F.

In the various catalogues of Coleoptera and works on Coleoptera which have attempted descriptions of the whole Beetle fauna of the British Isles, commencing with Marsham in 1802, sometimes one, sometimes two, and sometimes three species have been included with more or less of reservation. Of these, only one, *C. hemipterus* L., appears to have been consistently accepted without much reservation or qualification. The details tabulated on pp. 142-143 in parallel columns will enable these varying opinions to be compared.

Leaving out every other consideration except that of distribution, one would expect to find in *sexpustulatus* the one indigenous species in the six, with possibly *bipustulatus* in the second place; the other four being importations more or less numerous according to circumstances. Quite obviously Nos. 1, 3, 4 and 5, whatever may have been their original home, have been distributed over the globe in consignments of food stuffs, of which brown sugar, dried fruits and corn appear to be the chief. These species, with the exception of *hemipterus*, which has been taken at large on flowers, have never been found in any situation which would indicate their primitive food, while, on the other hand, the other two species, and more especially *sexpustulatus*, have been taken at large under bark, and amongst carrion, both foods common to a number of closely allied species amongst the undoubtedly indigenous *Nitidulidæ*. Moreover, Fowler's two or three British examples of 6-*pustulatus*, have increased to quite a handsome figure, something like twenty-five specimens having been met with in the Doncaster district alone. In every case they have been found either under bark, or amongst carrion, and not in one restricted area, but spread over a wide radius. Of course it is not advisable to accept too readily a claimant to the British List; it therefore becomes necessary to examine the various theories which have been propounded to account for the occur-

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Specific name.	1. *hemipterus* L.	2. *bipustulatus* Er.	3. *obsoletus* Er.	4. *mutilatus* Er.	5. *dimidiatus* Er.	6. *sexpustulatus* F.
Synonyms used by British authors.	*Nitidula flexuosa* Marsh. *Carpophilus flexuosus* Steph.	var. (of *hemipterus* L.) Crotch.			*Carpophilus pusillus* Steph.	
Recorded distribution, extracted from Murray's 'Monograph of the Family of Nitidulariae,' 1864.	'Universal.'	'Central Europe.'	'Siam, E. Indies, Ceylon, Phillipines, etc.'	'Central Europe, Madeira, E. & W. Indies, Australia, etc.'	'Europe, Madeira, N. America, E. & W. Indies, Australia, etc.'	'Found throughout Europe under the bark of trees, but not common in Britain.'
British authors and cataloguers who have included Carpophili in their works :—						
T. Marsham, Coleoptera Britannica, 1802.	×					
J. F. Stephens, Systematic Catalogue, 1829.	×				×	
Illustrations: Mandibulata, Vol. III., 1830.	× 'Whether this genus be truly indigenous is very doubtful.'				× 'Whether this genus be truly indigenous is very doubtful.'	
Manual, 1840.	× ('Improperly introduced into the British list.')				× ('Improperly introduced into the British list.')	
Spry and Shuckard, British Coleoptera delineated, 1840.	× ('A doubtful native.')				× ('A doubtful native.')	
G. R. Waterhouse, Catalogue, 1861.	×					

G. R. Crotch, Catalogue, 1863.	×	× †				
,, 2nd Edn., 1866.	× 'Naturalised.'				× ('Accidentally introduced.')	×
E. C. Rye, Catalogue, 1866.	×					× ('Reputed British, but requires further evidence before it can be considered truly indigenous').
D. Sharp, Catalogue, 1871.	× ?					× ?
H. E. Cox, Handbook, 1874.	× 'Common.'					× 'Rare.'
F. P. Pascoe, Student's list, 1882.	×					×
Fowler and Matthews, Catalogue, 1883.	×					
D. Sharp, Catalogue, 2nd Edn., 1883.	×					×
W. W. Fowler, Col. Britt., Vol. III., 1889. Ent. Mo. Mag. XXI.	×			×		× 'Only two or three British examples are known, and these are undoubtedly importations.'
Sharp and Fowler, Catalogue, 1893.	×			×		× 'Introduced.'
Beare and Donisthorpe, Catalogue, 1904.	×			× 'Introduced.'		× 'Introduced.'
Bayford and Thompson, Coleoptera of Yorkshire.						× 'Very rare.'
Victoria County History, 1907.	× 'Probably introduced' (*i.e.* into the county).			× 'Probably introduced' (*i.e.* into the county).		
W. E. Sharpe, F.E.S. in litt.			×			×

† (Possibly this may be an error for *bimaculatus* Oliv., which is one of the synonyms of *hemipterus* L. This record is not repeated in the 2nd edition, nor is its exclusion referred to by Crotch in his explanatory notes published in 'The Entomologist,' Vol. III.).

rence of the species where it has been found, in order to decide whether it is an indigenous or an introduced species. Two theories have been advanced, viz. :—

1. That it has been introduced into the locality with food intended for pheasant rearing.
2. That it has been introduced into the locality in dried or decaying fruits, such as raisins or currants.

Do these theories stand the test at every point ? If they do not explain *equally well*, the occurrence at *each place* then they are untenable. It is curious that the locality which furnishes the strongest proof of indigeneity, also throws the strongest doubt upon it. I refer to Edlington Wood where I took the first known specimen in 1894, and where Dr. Corbett and Mr. W. E. Sharp took specimens in 1911. It was on this last occasion that Mr. Sharp met with a specimen of *C. obsoletus*, a species hitherto unrecorded from the British Isles, although Mr. Sharp possesses another specimen which was undoubtedly imported into this country in dried fruit. They certainly cannot have been imported into this particular locality in pheasant food, because, whatever may be the case with the other localities, Edlington Wood is not now, and never has been, so far as can be learned, a place where pheasants have been reared, or game preserved. It has always been a fox-hunting wood. My own acquaintance with it goes back for twenty-nine years ; and other members of the Barnsley Naturalists' Society who have worked it for Lepidoptera during the last fifty-five years, confirm this view. This is sufficient to dispose of the ' pheasant food ' theory. There still remains the ' decayed fruit ' theory to be considered. Anyone who knows the holt where the species has been found, will recognise how absurd it is to imagine decayed fruit or any other rubbish being taken there to be thrown out. It is too far away from any dwelling-place. Finally, the species must have existed there continuously for a period of at least nineteen years, unless it is postulated that there has been an equally continuous introduction of foreign specimens during the same period. The same line of reasoning would cut out the raisin theory, in all but one of the localities, or, rather, it could only hold good in one for it is not reasonable to suppose that there have been as many different deposits of decaying fruit as there are localities in which the species has been found. These localities are some considerable distance from each other, the smallest plane figure which will contain them having an area of $24\frac{1}{2}$ square miles. The unobtrusive nature of the insect, its small size, dark colour, and the habit of simulating death, which it possesses in common with many other species, combine to preserve it from most of its enemies, including, no doubt, coleopterists. Other species with this characteristic,

e.g., *Attagenus pellio* and *Trox scaber*, are undoubtedly very much more numerous than the comparatively few and isolated records would lead us to suppose. From a careful study of the facts in all their bearings, and my knowledge of the district, I conclude that the species is indigenous, or alternatively, that if it has been introduced, that such introduction is sufficiently remote for it to have become well established.

In closing this article, I think the following summary of the Yorkshire specimens may be useful :—

One specimen, Edlington Wood, 1894 (E. G. B.).
One specimen, Sandal Beat Wood, 1904 (H. H. C.).
Eight specimens, Wheatley Wood, 1907 (E. G. B., H. H. C., V. C.).
One specimen, Cusworth, 1907 (H. H. C.).
Four specimens, Edlington Wood, 1911 (H. H. C.).
Eight or ten specimens, Edlington Wood, 1911 (W. E. S.).
Three specimens, Sandal Beat Wood, 1912 (H. H. C.).

The initials are those of Dr. Corbett, his son, Mr. Sharp and myself.

Amongst themselves the specimens differ in the size of the spots, which are occasionally reduced to such a degree as to be seen with difficulty by unaided sight.

The problem raised by the capture of *C. obsoletus* is an interesting one, but there is as yet not sufficient evidence to discuss it satisfactorily.

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Bird Notes from the Scarborough District.—I found the first full clutch of Lapwing's eggs on April 7th. Nests had been ready for a week or ten days, but laying had evidently been delayed, owing, perhaps, to the cold winds. Woodcock seem to be more numerous than usual in this district. I put up three on April 10th and two on April 7th in different localities. On April 14th I found a Snipe's nest with four eggs, an early date for this district.—STANLEY CROOK.

——: o :——

At a recent meeting of the Lancashire and Cheshire Entomological Society, Mr. W. Mansbridge gave the results of his breeding experiments with the Black Race of *Boarmia repandata* (var. *nigra*), and summarised the results as follows :—In 1909 (*a*) a wild ♀ of the local type form gave all var. *nigra* ; (*b*) a wild ♀ var. *nigra* gave all black moths ; (*c*) a pairing of *nigra* ♂ and type ♀ gave all types. In 1910 (*a*) type × type gave 66·6 per cent. type, and 33·3 per cent. var. *nigra* ; (*b*) *nigra* × *nigra* gave 92 per cent. *nigra* and 8 per cent. type ; and (*c*) *nigra* × *nigra* gave 96 per cent. *nigra* and 4 per cent. type ; while in 1911 (*a*) type × type gave all type ; (*b*) *nigra* ♂ × type ♀ gave all *nigra* ; (*c*) *nigra* × *nigra* gave 95·7 per cent. *nigra* and 4·3 per cent. type, and (*d*) × second experiment of the same gave 70·5 per cent. *nigra* and 29·5 per cent. type. In 1910 moths from the broods *a* and *c* were used for the cross pairings of type and variety, the others being inbred, and in 1911 all were inbred.

A MUSEUM OF FISHERIES AND SHIPPING.

(PLATE XIV.).

On Saturday, March 30th, was opened the Museum of Fisheries and Shipping in the Pickering Park, Hull. With this museum the city of Hull has reason to be proud of the forethought of her councillors and the munificence of one of her citizens. Few towns of the size of the third port can boast of so many, and such excellent treasure-houses for things of historic and scientific interest as the three institutions now under the charge of Mr. T. Sheppard. It is not many years since we had the pleasure, in this journal, of complimenting the city of Hull upon its museum of natural history and antiquities in Albion Street. A few years later we lavished equal praise upon the enlightenment of her citizens in opening as a public museum the celebrated Elizabethan home of William Wilberforce, and filling it with the relics of slave emancipation and objects illustrative of Hull's history. It was largely through the personal exertion of the present Chairman of the Museums Committee, Alderman J. Brown, Sheriff of Hull, that Wilberforce House became municipal property, and we venture to think that he never rendered a greater service to his city than this. Now, under the same Chairman, and under the direction of the same Curator, it falls upon us to announce the opening of a third museum, which is entirely devoted to the history of shipping and fishing.

The site of the Museum and the building itself have been handed over to the Hull Museums Committee by Mr. Christopher Pickering, J.P., who recently presented the magnificent Pickering Park on the Hessle Road, Hull, adjoining which the Museum is situated.

From many points of view the situation is excellent: the district in which it is located is essentially the home of the fishing industry, and is not far from the Fish Docks; it is pleasantly surrounded by fields and shrubberies; and it has round about it room for extension, a not unimportant asset.

Mr. Pickering's interest in the institution has not ceased with the building of it. He has used his influence in inducing shipowners, shipbuilders, and others to present models of ships, etc., to the Museum, and in this way a very valuable series, and one that will year by year become increasingly valuable, illustrating the evolution of the steam trawler, liner, man of war and other types of ship, has been obtained.

The Museum was formally opened by Mrs. Pickering, who, in a graceful speech, expressed the pleasure of herself and her husband at the way in which the exhibits had been arranged by the Hull Museums staff, and at the thought that the place

would be a source of interest and instruction to many thousands of people annually. The idea had occurred to them, she said, that the park in which the Musuem was placed would be more complete if there were some building to which visitors might resort for rest and interest, and this idea had materialised in the form of a Fisheries and Shipping Museum. Other speeches were made by Mr. Christopher Pickering, the Sheriff of Hull (Alderman J. Brown), the Mayor (Councillor T. S. Taylor), Councillor J. H. Robins, the Right Hon. T. R. Ferens, M.P., and Alderman E. Hanger.

The building itself is of red brick, faced with stonework, and with red granite pillars at the entrance. Its interior fittings are of oak, and the arrangement of the lighting, chiefly from the top, is excellent.

In a port like Hull there is much scope for a museum of this nature. In the first place, it is proposed to illustrate as far as possible, by means of models, pictures, etc., the evolution of the fishing industry in Hull, in reference to both the type of vessels engaged at various periods, and to the appliances used. In a similar way, Hull's importance in former times as a whaling port will be brought home to the visitor by means of suitable exhibits. Needless to say, shipping, mercantile and naval, will also receive a good deal of attention, and the changes in type of both sailing and steamships, will be exhibited by means of models.

But what is above all of interest to the naturalist, is the opportunity now opened, of which full advantage will be taken, for the exhibition of specimens of the various forms of life that inhabit the sea. Here is a branch of museum work which should be a great educational factor in a fishing centre. The different food fishes, their life histories, and their enemies, can be exhibited along with the lower forms of marine life. If the co-operation of the North Sea Fisheries Investigation Committee were obtained, what a valuable series of specimens could be got together. Such a collection, together with objects and photographs illustrating the methods of fishery investigation in the North Sea, would also serve to give to the fishermen of Hull a clear and intelligent insight into this inquiry, and thus make it of even more practical value than it is.

A word as to the exhibits already housed in the museum. The most complete series at the present time is perhaps that of the whaling relics. It includes the various types of harpoons, models and paintings of whaling ships, articles made of whalebone, etc., etc. The old museum at the Royal Institution, Hull, contained a fine series of Esquimaux relics, brought to Hull by the old whalers, and these have now been accommodated in the new building. On the grounds outside, a pair of large whale jaws have been fixed in the form of an arch, in a

similar way to those frequently seen in the environs of Hull, at the gateways to fields and gardens. Some fine skeletons of several smaller species of whales are also shown, together with a fœtal whale, and a cast of the White-beaked Dolphin.

The models of ships already on exhibition include types ranging from early wooden battleships to the latest type of cruiser built at Hull, and from primitive sailing-ship to the most up-to-date liner. The model of H.M. cruiser "*Endymion*," presented by Lord Nunburnholme, and that of the recently ill-fated liner "*Bayardo*," presented by Messrs. Thos. Wilson, Sons & Co., Ltd., are exquisite specimens of handicraft. As a contrast to the present-day "*Endymion*," and as an illustration of the enormous change in naval construction in the course of a century, is a contemporary model of H.M. frigate "*Endymion*," of fifty guns, built at Devonport in 1807, exhibited along with a model of H.M. battleship "*Britannia*" of one hundred and twenty guns, also built at Devonport in the same year. Interesting models of early types of Humber paddle-boats, steam trawlers, etc., serve to complete the series, which has been enhanced in value since the opening of the Museum, by the addition of the early Cunard paddle-boat, "*The Persia*."

By the generosity of the various trawler-owners on the St. Andrew's Dock, the collection of models of trawlers and fishing appliances is very complete. Mr. A. Mudge has presented a case of models of nets braided to scale, including a form of trawl of which he was the inventor, and to which the rapid development of the fishing industry in Hull is largely due; and a model of the 'otter' trawl has been presented by Mr. John Walton.

At the closing of the Japan-British Exhibition, the Japanese Government presented to the Hull Museums authorities a series of large scenic models illustrating different modes of fishing in Japan. Exhibits such as these should prove full of suggestion to local fishery authorities.

The exhibits of natural history specimens are varied and numerous. Mounted specimens of the larger marine fishes and sharks are fixed where they are well seen. The greater proportion of these have been caught on the Yorkshire coast, or in the North Sea, and their value is thereby increased. An extensive series of fishes preserved in spirits has been presented by the British Museum, and the Japanese donations referred to above include series of preserved specimens, illustrating the development and life-history of the Japanese carp, oyster, prawn, turtle, eel, etc.

A special case has been set apart for the beautiful collection of corals, presented by the late John Morgan, of Worthing. In addition to the above are skeletons of many species of

fishes and cetaceans ; a series illustrating the arrangement of the internal organs, nervous, vascular and skeletonal system of the Pike ; and miscellaneous marine biological objects from the North Sea. It will thus be seen that the exhibits already brought together are of great scientific interest, and it only remains for the curator, with the assistance of those engaged in the fishing and shipping industry in Hull, and with the co-operation of local naturalists, to perfect a work so well begun.—B.A.

The **Journal of the Northants Natural History Society and Field Club** for 1911 is well up to the usual standard. Among the papers we notice 'Northamptonshire Birds,' by Mr. J. D. Cotton ; 'Some Aquatic Plants,' by Mr. H. N. Dixon ; 'Water Divining and Radioactivity,' by Mr. Beeby Thompson, and a valuable paper on 'Plot's Elm (*Ulmus plotti*),' by Mr. G. Claridge Druce. This species appears to have been first distinguished by Mr. Robert Plot in his 'Natural History of Oxfordshire, 1677,' where he describes it as 'a narrow-leaved elm, which also being smooth, justly deserves the name *Ulmus folio angusto glabro.*' Mr. Dixon gives an account of Northamptonshire Hepatics ; Mr. M. B. Fullerton describes the algæ found in the Midsummer Meadow Bathing Place ; Mr. J. H. Fletcher has a paper on 'The Gull' ; Mr. Beeby Thompson describes 'Peculiarities of Waters and Wells,' and Mr. T. J. George figures a remarkably fine Celtic bronze mirror found at Desborough. We are kindly permitted to reproduce one of the blocks.

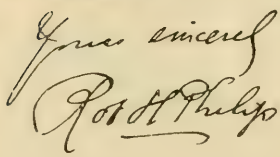
Plot's Elm (*Ulmus plotti*).

The **Proceedings of the Geologists' Association,** Vol. XXIII., pt. 2, issued March 21st, 1912, contain a report of the Association's excursion to the Dales of West Yorkshire and Harrogate, held in July 1910.

In Memoriam.

ROBERT H. PHILIP
(1852—1912).

RECENTLY it has been our pain to record many great gaps in the ranks of northern naturalists. Gaps that it will be difficult, if not impossible, to fill. And the most recent of these is caused by the death of Robert H. Philip, of Hull, which occurred on April 15th; and it was a surprise to most to learn that he had passed his sixtieth birthday.



For many years Mr. Philip has been a regular attendant at the meetings of the Yorkshire Naturalists' Union. He was exceedingly well versed in many branches of science, was a great reader, and an able critic. On several occasions he has favoured us with papers, which have not only been valuable from the record of original work and research which they contained, but were remarkable from their exceptionally fine literary style. Retiring in disposition, and of a quiet nature, Mr. Philip was nevertheless particularly brilliant in discussion or debate, and he had the quick eye and warm heart of a true humorist. Yet his wit was never known to be offensive, and to be hurtful or unkind was as opposite to his nature as are the poles.

It is now a quarter of a century since the writer first made his acquaintance, and in that time he has seen practically no change in him. He always had the same pleasant smile, the same helping hand, the same sound advice, the same sincerity.

Though possessing a knowledge of natural science far above the average, he seemed particularly partial to botany, especially the lower forms of plant life, such as the microfungi, diatoms, etc. As a microscopist, also, he had an excellent reputation, and as a writer and lecturer on matters microscopical, had few equals in the north of England. He was nearly always present at the annual Fungus Forays of the Yorkshire Naturalists' Union, and at the last meeting at Mul-

grave, read an admirable paper on the Uredineæ, which was much appreciated, and was printed in the pages of this journal. At the Sedburgh meeting of the same Union he read an admirable paper on the ' Diatoms of the Sedburgh District,' which was far more than a mere list of the species occurring in that area, and demonstrated that with such a well-known subject as that of the diatoms, there was much original work still to be done, and his remarks had much bearing upon the question of the evolution of these lowly forms of life.

For many years the pages of *The Naturalist* have been enriched by his writings, and as Secretary of the Yorkshire Micro-Zoology and Micro-Botany Committee, he has long assisted Yorkshire naturalists in their work. In Hull particularly, is his loss felt. The Hull Scientific and Field Naturalists' Club, of which he was a past-president, revered and respected him. He rarely missed a meeting or excursion, and never came but the members derived some benefit from his knowledge. He was also exceedingly clever at writing poetry, particularly in the way of humorous parody. His poem on ' Our Average Member,' prepared for a social gathering of the Hull Club, and printed in the Hull Club's Transactions, has especial merit.

Perhaps the greatest single piece of work he accomplished was the examining and cataloguing of the enormous collection of East Yorkshire, etc., diatoms, formed by the late George Norman, and now in the museum at Hull. In this he had the co-operation of Mr. F. W. Mills, F.R.M.S., of Huddersfield, and, in addition to Norman's records, he included many additional observations of his own. This work, which contained an illustration of each species, originally appeared in the Transactions of the Hull Club, and was subsequently published by Messrs. Wesley and Sons, London,* and each year the Transactions of the same society have included illustrated papers containing additional records to this list, as some evidence of his zeal.

He was the true type of naturalist. As a writer he was splendid. As a critic, humorous and severe, but kindly. But only those who were favoured by his friendship can appreciate his sterling worth.

But however great is our loss, that of the widow and children must be much more. And we feel sure that every reader of this journal will join us in our sympathy with them.—T. S.

In *The Entomologist's Record* for March, Mr. H. C. Dollman describes a beetle (which usually has plain elytra, but in this particular case has ' six ivory black spots ') under the delightful name *Mysia oblongoguttata* L., ab. *nigroguttata* n. ab.

* The Diatomaceæ of the Hull District. 4/6.

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T. SHEPPARD, F.G.S.

For an account of the previous instalments of this Bibliography see *The Naturalist* for July, 1911, page 257. The present list contains the entries for 1910, with the exception of the Yorkshire items, which will appear in the Memorial Volume to the late C. Fox Strangways, which is being edited by the present writer, and is now in the press.

1910.

ANON. Derbyshire, Notts., Yorks.

Summary of Progress of the Geological Survey of Great Britain . . . for 1909 [refers to work in Derbyshire, Nottinghamshire, and Yorkshire; with an appendix on Ingleton Borings by W. Gibson]. 1910, pp. iv.+92.

ANON. Lancs., S.

[**Note recording young antler of** *Cervus megaceros*, **found at Martin Mere, near Southport, Lancs.**]. 'Nature,' March 24th, 1910, p. 102.

ANON. Yorks., Derbyshire, etc.

[**Obituary Notice of C. Fox-Strangways, containing reference to his work in Yorkshire, etc.**]. 'Nature,' March 24th, 1910, pp. 104-5.

ANON. Notts.

The Geology of the Melton Mowbray District and South East Nottinghamshire, by G. W. Lamplugh, etc. [Review of]. 'Geol. Mag.', April 1910, pp. 181–2.

ANON. Notts.

Nottingham Fossils. [Notice of Mr. Moysey's paper]. 'The Naturalist,' June 1910, p. 219.

ANON. Lancs., S.

Cave Remains from Wharton Crag. [Notice of paper]. 'The Naturalist,' March 1910, p. 105.

ANON. Yorks., S.E., etc.

Geography at the British Association. [Summary of papers read]. 'Nature,' October 27th, 1910, pp. 551-553.

ANON. Northern Counties.

The Presidential Address [at the Sheffield Meeting of the British Association] a criticism of Prof. Bonney's address, with many references to northern glacial geology]. 'The Naturalist,' October 1910, pp. 353-357.

ANON. Northern Counties.

British Association for the Advancemant of Science . . . Sheffield, September 1-7, 1910. List of Titles of papers read in section C. (Geology) and other sections bearing on Geology [66 items]. 'Geol. Mag.', October 1910, pp. 469-471.

ANON. Northern Counties.

European Glacial Deposits: Limits of the Ice Sheet: Yorkshire Drifts: Aspect of the Drifts: Moraines: British Ice Sheets: Conclusion [Notice of Mr. Frank Leverett's paper]. 'The Naturalist,' December 1910, pp. 416-418.

ANON. Northumberland, Durham.

An Account of the Strata of Northumberland and Durham, as proved by Borings and Sinkings. Supplementary Volume, pp. 1-572, Newcastle, 1910.

ANON [signed 'Flora'] Lancs.

Peat, Forest, and Beaver. [Criticism of Mr. Stubbs' Notes]. 'Lancs. Nat.', June 1910, pp. 95-97.

(Mrs.) E. A. NEWELL ARBER.

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Investigation of the Fauna and Flora of the Trias of the British Isles—Seventh Report of the Committee. [Includes Report on Footprints from the Trias, by H. C. Beasley; On a Skull of *Rhynchosaurus* in the Manchester Museum, by D. M. S. Watson; Bibliographical Notes upon the Flora and Fauna of the British Keuper, by A. R. Horwood, etc.]. 'Rep. Brit. Assn.', Winnipeg, 1909 (publ. 1910), pp. 150-163.

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The Witham and The Ancaster 'Gap' a study in River Action. 31 pp. [1910]. (Privately printed).

R. C. Burton. See A. R. Dwerryhouse.

J. W. Carr. Notts.

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The Vertebrate Fauna of Cheshire and Liverpool [gives list of remains of mammoth, *E. antiquus*, etc.]. London, Vol. I., 1910, pp. 1-472.

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A. R. Dwerryhouse (Secretary).

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T. L. ELWEN. See WILLIAM MORLEY EGGLESTONE.

J. R. FARMERY. See C. R. BOWER.

W. G. FEARNSIDES. See J. E. MARR.

A. M. FINLAYSON. Lake District.

The Ore-bearing Pegmatites of Carrock Fell, and the Genetic Significance of Tungsten-ores [describes the wolfram veins in the Grainsgill Greisen, near Carrock Fell]. 'Geol. Mag.', January 1910, pp. 19-28.

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W. STORRS FOX. Derbyshire.

Ravencliff Cave [records details of excavations, and gives the following remains:—man, cat, dog or wolf, fox, badger, bear, ox, sheep or goat, deer, boar, horse, rhinoceros, hare, rabbit, vole, birds (including eagle), frog and toad]. 'Journ. Derbyshire Arch. and Nat. Hist. Soc.', Vol. XXX., 1910, pp. 141-146.

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The Origin of the British Trias [abstract], 'Brit. Assn. leaflet'; and 'Geol. Mag.', October 1910, pp. 460-463.

A. R. HORWOOD. Derbyshire, Notts.

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Preliminary Report on the Exploration of 'Dog Holes' Cave, Warton Crag, near Carnforth, Lancashire [with plan], 'Trans. Lancashire and Cheshire Antiq. Soc.', Vol. XXVII. (pp. 1-32 of reprint).

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(Mrs.) E. Jones. See A. R. Dwerryhouse.

T. A. Jones. Isle of Man.

Note on the 'Augite Porphyrite' of Scarlett Stack, Isle of Man, and Associated Rocks. 'Proc. Liverpool Geol. Assn.', N.S., No. 4, 1907-9 (publ. 1910), pp. 22-26.

P. F. Kendall. Cheshire, Notts., etc.

'The Origin of the Trias Rocks of England.' 'Trans. Leeds Geol. Assn.', pt. 15, 1908-10, pp. 36-37.

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Philip Lake, and R. H. Rastall. Northern Counties.

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Introduction to the Study of Minerals and Guide to the Mineral Collections in Kelvingrove Museum [includes particulars of Lake District, etc., minerals]. Glasgow, 1910, 70 pp.

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G. W. B. MACTURK, W. H. CROFTS, and J. W. STATHER.

Notes on the Field Excursions [**of the Hull Geological Society**] **in the years 1905-9** [with lists of fossils from various localities, details of section at Barton-on-Humber, etc.]. 'Trans. Hull Geol. Soc.', Vol. VI., pt. 2, 1910, pp. 132-141.

J. E. MARR. Lake District.

The Lake District and Neighbourhood—Lower Palaeozoic Times.' Geology in the Field,' pt. 3, London, 1910, pp. 624-641.

J. E. MARR. Lake District.

The Lake District and Neighbourhood (continued)—**Upper Palæozoic and Neozoic Times.**—' Geology in the Field,' pt. 3, London, 1910, pp. 642-660.

A. J. MASLEN. See D. H. SCOTT.

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E. MERRICK. See A. R. DWERRYHOUSE.

H. W. MONCKTON and R. S. HERRIES [edited by]. Northern Counties.

Geology in the Field. The Jubilee Volume of the Geologists' Association (1858-1908), [contains papers bearing on the geology of the northern counties, referred to separately under the respective authors]. London, 1910, 896 pp. Reviewed in 'Geol. Mag.', Aug 1910, pp. 370-1.

L. MOYSEY. Derbyshire, Notts.

On Some Rare Fossils from the Derbyshire and Nottinghamshire Coalfield. 'Brit. Assn. Leaflet,' 10 pp., and 'Geol. Mag.', Oct. 1910, pp. 474-475.

LEWIS MOYSEY. Derbyshire, Notts.

On Palæoxyris and other Allied Fossils from the Derbyshire and Nottinghamshire Coalfield [describes *P. prendeli, P. carbonaria, P. helicteroides, P. johnsoni, Vetacapsula cooperi, Fayolia dentata, and F. crenulata*]. 'Quart. Journ. Geol. Soc.', Vol. LXVI., No. 263, Aug. 1910, pp. 329-345; abstract in 'Nature,' April 7th, 1910, p. 179; 'Geol. Mag.', May, p. 232; and 'The Naturalist,' June 1910, p. 219.

MARION I. NEWBIGIN. Northumberland, etc.

The Physical Environment —Meteorology, etc. [refers to the Northumberland Sand-dunes, etc.]. 'The Book of Nature Study,' Vol. VI., 1910, pp. 1-91.

A. NEWELL. [See J. H. GREENWOOD].

ALFRED NEWSTEAD. Cheshire.

Curator and Librarian's Report [**of the Grosvenor Museum, Chester**, includes a mammoth tooth, the only authentic Cheshire example]. 'Chester Soc. of Nat. Sci., etc., Thirty-ninth Annual Report.', 1910, pp 17-23.

C. OLDHAM. See T. A. COWARD.

CHARLES PILKINGTON and PERCY LEE WOOD. Lancs., S.

The Sinking of the Astley Green Shafts, at Astley, near Manchester, by means of the drop-shaft method and under-hanging tubbing [brief geological notes]. 'Trans. Manch. Geol. Soc.', Vol. 31, pts. XVI.-XVIII., 1910, pp. 300-324.

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W. MUNN RANKIN. Lancs., N.

The Peat Moors of Lonsdale: an Introduction. 'The Naturalist,' March 1910, pp. 119-122; April 1910, pp. 153-161.

ROBERT HERON RASTALL. Lake District.

The Skiddaw Granite and its Metamorphism [abstract of paper read to the Geological Society]. 'Nature,' January 13th, 1910, p. 328; 'Knowledge,' July 1910, p. 280; 'Geol. Mag.', January 1910, pp. 92-93.

R. H. RASTALL. See PHILIP LAKE.

C. H. READ. Derbyshire.

Ravencliff Cave [gives details of discoveries made during excavations]. 'Journ. Derbys. Arch. and Nat. Hist. Soc.', Vol. XXX., 1910, pp. 147-151.

F. R. COWPER REED. Cumberland.

New Fossils from the Dufton Shales [including *Trinucleus nicholsoni* sp. nov.; *Acidaspis semievoluta* sp. nov.; *Homalonotus ascriptus* sp. nov.; *Beyrichia* (*Ceratopsis*) *duftonensis* sp. nov.; *B.* (*Ctenobollina?*) *superciliata* sp. nov., and *B.* (*Tetradella*) *turnbulli* sp. nov.]. 'Geol. Mag.', May 1910, pp. 211-220 (plates).

F. R. COWPER REED. Lake District

New Fossils from the Dufton Shales, Pt. 3 [describes *Crisinella wimani*, *Orthis duftonensis*, *O. melmerbiensis*, and *Orthis* (*Scenidium*?) *equivocalis*]. 'Geol. Mag.', July 1910, pp. 294-299.

D. H. SCOTT and A. J. MASLEN. Lancs., S.

On *Mesoxylon*, a New Genus of *Cordiatale* (preliminary notice). 'Ann. of Botany,' 1910, p. 236, and 'Knowledge,' Nov., 1910, p. 448.

ERNEST B. SAVAGE [and] P. M. C. KERMODE. Isle of Man.

The Manx Museum and Ancient Monuments. Trustees' Fifth Annual Report . . . with list of Additions to the Museum [brief geological notes], Douglas, 16 pp.

EDWARD SANDEMAN. Derbyshire.

Excavation Discoveries in the Derwent Valley [figures a well-preserved 'fossil fish' (*Acrolepis hopkinsi*) and includes a description by Dr. Smith Woodward. 'Journ. Derbys. Arch. and Nat. Hist. Soc.', Vol. XXX., 1910, pp. 73-75.

A. C. SEWARD. Northern Counties.

Fossil Plants and Text-book for Students of Botany and Geology. Vol. II., Cambridge, 1910, pp. xxii.+624.

(To be continued).

Naturalist,

REVIEWS AND BOOK NOTICES.

Poppies, by **George Gordon,** is the title of the latest of the useful penny handbooks issued by the Agricultural and Horticultural Association, London. It is well illustrated.

Extinct Animals of East Yorkshire, etc. Illustrated Guide to the Hull Whaling Relics, etc., Quarterly Records of Additions, September, December, 1911 ; Hull Museums : Annual Report for 1910 ; being Hull Museums' Publications, No. 81-85.

Here is a quintette of these useful little handbooks. Alike in size, shape, orderly arrangement, and in the value of their contents ; they differ widely in the specific nature of those contents. Each one will appeal specially to some, and all of them have something of interest to every reader. Those who would watch the growth of the Hull museums will naturally turn to the quarterly records of additions, and to the excellent report for 1910. Why this latter has been so late in appearing as the autumn of 1911 is not apparent. It is really too bad to delay such a good report ; not that the delay has in any way detracted from its value, but because the public have been deprived of the pleasure of reading it sooner. The last time we had the pleasure of noticing these publications, there were two museums in Mr. Sheppard's care, now there are three ; and we gather that the original museum has been increased in size by the addition of space formerly devoted to objects of art. These extensions have made it possible for the exhibits to be arranged in a more natural manner ; the removal of the fishing exhibits to the new museum in Pickering Park, opened March 30th, will give to Hull the unique possession of a permanent display of objects dealing solely with the fishing industry, using that term in its widest sense. To the original local collection has been added a number of valuable exhibits which have been presented by the Japanese Government.

The natural history exhibits have received many necessary additions, making them more representative. From the abundance of good things, it is most difficult to make a selection without appearing to do an injustice to the remainder. We should like to draw attention to the addition in Birds, of the Riley-Fortune collection ; Conchology, the fine Schlesch collection in thirty drawers, a catalogue of which will soon be accessible. Twenty Spiders, most of them new to Yorkshire, and the brackish-water-beetle *H. mulsanti*, also new to the county, have been added by Mr. Stainforth. Besides these there is a splendid list of geological finds which have been added to the already large display in this branch of science. Mr. Sheppard is to be congratulated on the results of the year's work as detailed in this report, which should be in the hands of everyone interested in museum management.

Perhaps the item which deserves special mention is a paper with the title 'Pastimes for Curators,' read at the Brighton Conference of Museum Curators, 1911. Written in Mr. Sheppard's characteristic style, its reading will give pleasure to many besides professional museum curators. The pervading satiric humour will be generally appreciated, and it is to be hoped that most of its readers will realise also the author's serious intent. The following quotation is quite to the purpose of this notice of the museum's publications :—'Now as regards the value of these penny pamphlets. In the first place . . . they prevent a certain gentleman finding mischief for idle hands, by keeping the curator occupied. Secondly, they form a running descriptive catalogue of the exhibits, which will be a boon and a blessing to following curators and committees ; and we must remember that our museums are to last for all time. Thirdly, they enable those interested in any particular subject to have every information thereon at a minimum of cost. Fourthly, as "sprats."' We sincerely wish the curator may catch a shoal of mackerel.—E. G. B.

PROCEEDINGS OF PROVINCIAL SCIENTIFIC SOCIETIES.

Mr. William Hill's Presidential Address to the **Geologists' Association,** entitled 'Rocks containing Radiolaria,' is printed in the Association's **Proceedings,** recently issued.

The **Proceedings of the Liverpool Naturalists' Field Club** for the year 1911 is principally occupied by a report of the Field Excursions (mainly botanical), and a useful 'Contribution towards a Fungus Flora of the Hundred of Wirral,' by John W. Ellis.

The **Birmingham and Midland Institute** has recently issued its valuable 'Records of Meteorological Observations, taken at the Observatory, Edgbaston, 1911,' by the Curator, Mr. Alfred Cresswell. The report is supplemented by the usual tables and diagrams. It is sold at 2/-

The **Warwickshire Naturalists' and Archæologists' Field Club** has recently issued its 54th and 55th annual reports. They contain summaries of the two years' work (1909-10), a note on the Basement Bed of the Keuper, by F. T. Maidwell, and a History of Geological Discovery in Warwickshire, by the same author. The society's balance in hand yearly becomes greater.

The **Fifteenth Report of the Southport Society of Natural Science for 1910-11** is rather disappointing. There are articles on Halley's Comet, Galileo, Photographic Optics, Aquatic Hemiptera, and Chemical Synthesis, all of which subjects, excellently treated, can be found in the leading reference books. There is not a single note bearing upon the natural history, archæology or geology of the Southport district. In addition, the paper is very poor, and the typography is anything but pleasing. Apparently the Society has too much money, and does not know how to spend it.

The Transactions and Journal of Proceedings of the Dumfriesshire Natural History and Antiquarian Society, N.S., Vol. XXIII. for 1910-11, again fills a substantial volume, there being over 350 pages, which for the most part are confined to the sphere of the Society's work. There is an interesting and well-illustrated paper on Communion Tokens, and many other notes of local antiquarian interest. Mr. S. Arnott has a paper on 'Local Plant Names'; Mr. H. S. Gladstone writes on 'Cummin's Ash,' an ancient ash tree; Mr. Rutherford writes on 'Weather and Natural History'; Dr. J. M. Ross on 'Weather in relation to Health'; and Mr. A. Watt gives Rainfall Records; Mr. W. J. Payne writes on bird life in the south of Scotland, and Mr. J. M'Andrew describes Hepatics and Mosses of the same district. There are many illustrations, and a good index.

The **Journal of the Derbyshire Archaeological and Natural History Society** (Vol. XXXIII., 1911, 254, xxviii pp.), is well illustrated, and the papers are all of local interest. Amongst those coming within the scope of this journal may be mentioned 'The Promontory Forts of Derbyshire,' by E. Trustram; 'The "Harbour" and Barrows at Arbour-Lows,' by S. O. Addy; 'Bradwell Lead Mining Customs,' by S. Evans; 'The Lows in the High Peak,' by T. A. Matthews; 'Roman Roads'; and 'Roman Camp near Coneygrey House,' by W. Smithard; 'Derbyshire Cave-Men of the Roman Period,' by W. S. Fox; 'Chapel-en-le-Frith Churchwardens Accounts,' by H. Kirke (with entries of amounts paid for hedgehogs, ravens, badgers, foxes (11/- being paid 'for killing a fox' in 1804); for 'wiping [whipping] doggs,' etc.); Edward M. Wrench, M.V.O., F.R.C.S., writes nonsense on 'Glacial Stones'; the Rev. F. C. R. Jourdain gives a useful Zoological Record for 1910; and T. Gibbs gives 'Mycological Notes' on the seasons 1909-10, in which he records 220 new county records, and 15 species and one variety recorded are either new to science or to Britain.

NEWS FROM THE MAGAZINES.

Dr. R. S. MacDougall has an illustrated article on 'Mustard Beetles,' in *The Journal of the Board of Agriculture* for March.

Part 3 of Cassell's *Nature Book* contains a magnificent reproduction, in colours, of MacWhirter's 'June in the Austrian Tyrol.'

A specimen of Rudolphi's Rorqual was washed up on the beach on the Northumberland coast early in February.—*Zoologist*, No. 849.

The *New Phytologist* for March contains an able and well-illustrated paper on 'The Shingle Beach as a Plant Habitat,' by Prof. F. W. Oliver.

After describing in detail the 'observed fall of an aerolite' near St. Albans, in *Nature*, the writer of the note submitted the specimen to the British Museum, and it turns out that the stone is not of meteoric origin.

A Black-tailed Godwit was shot near Spurn on February 3rd (*British Birds*, April). The same journal records that a nestling black-headed gull, ringed at Egton, Yorkshire, in July 1911, was recovered on the island of Flores, in the Azores, in February 1912.

Part II. of Cassell's *Nature Book* contains an article on 'The Delights of the Garden,' by Mr. H. H. Thomas, which is illustrated by photographs of some Yorkshire gardens. There are excellent photographs of 'woolly bears,' and tiger moths, birds, daisies, field mice, etc.

The deaths of two geologists, both of whom had handed their collections over to the Manchester Museum, are recorded in the *Geological Magazine* for April. Two other geologists who have recently handed over their collections to a well-known Yorkshire Museum are still alive. *Verb. sap.*

The *Library Circular* issued by the Sunderland Public Libraries, contains a plate illustrating local pre-historic remains recently added to the Museum. We are surprised to find that this usually up-to-date library has not a copy of Mortimer's 'Forty Years' Researches' amongst its books dealing with pre-historic man.

Part VIII. of *The Micrologist* completes the first volume. It contains an admirable plate of photo-micrographs of larvæ, etc. Mr. Abraham Flatters contributes an article on Vermes, etc.; Mr. Herbert Womersley writes on Terpineol, a New Clearing Agent; and Mr. G. A. McKechnie has a note on Mounting Museum Specimens of Insects as Microscopical Slides. (Manchester, 1/6 net).

In *The Museums Journal* for April, Messrs. Crouch, Butler and Savage, have an illustrated article on 'The New Library and Art Gallery, Manchester,' from which we gather that 223 designs were submitted for the building. Oddly enough, we are informed that the successful competitors were Messrs. Crouch, Butler and Savage. In the same journal Dr. F. A. Bather has an article on the new London museum.

We have received No. 6 of the *Hastings and East Sussex Naturalist*, which is an unusually good number. (Burfield & Pennells, Hastings, 2/-) Mr. W. E. Nicholson has an excellent memoir on the Hepatics of Sussex, which is well illustrated, the plate of *Cephalozia macrantha* Kaal. and Nicholson, being particularly fine. Mr. T. Parkin writes on Beauport and its Rookery, and also gives an account of a Sussex Shooting-Decoy. The Rev. E. N. Bloomfield gives a list of 'Sussex Fungi, Part 1, Supplement,' and also contributes notes on the local fauna and flora. There is a reprint of a note on a 'New British Bird,' from another paper, in the pages of which we think it might have been allowed to remain.

NORTHERN NEWS.

A public museum has been opened at Newark.

On July 15th next, the Royal Society will celebrate its 250th birthday.

The Lapwing is now protected throughout the year in Cumberland, Northumberland and Lancashire.

The interesting old church at Hickleton has been seriously damaged by subsidence, as a result of the mining operations in the vicinity.

It is a significant fact that a certain northern librarian has ceased to advertise drinks on the cover of his monthly 'circulars,' and is advertising perambulators instead!

Mr. F. Barker has resigned the secretaryship of the Halifax Scientfic Society, after occupying the position for twenty-three years. Mr. J. H. Lumb is now the secretary.

According to the *History of Withernsea*, recently issued, the following birds 'yearly nest' at Spurn :—'Tern, Sheldrake, Oystercatcher, Golden Plover, Dunlin, Godwit, etc.'

A boy was brought before the magistrate at Penrith on the 9th April, for gathering eighteen eggs of the Plover, the bird being now protected throughout the year in Cumberland.

We learn from the daily press that 'a red admiral butterfly was caught by a police sergeant in the old gaol yard, Scarborough, on Wednesday.' We hope that the attention of his chief will be drawn to the sergeant's smartness.

A hint. The curator of a Yorkshire museum, who was lecturing in the Scarborough museum recently, cast envious eyes upon some of the specimens there. The council has since met, and is making enquiries as to the rate of insurance against burglary.

The science of the popular magazine is only equalled in the extent and variety of its information by that of the bookseller's catalogue. We have just seen the following items under 'Marine Botany' :—'On Pourtalesia, a genus of Echinoidea,' by Loven, and 'The Genera Vermium,' by Barbut.

In the list of publications received by a well-known American museum, we notice that the Warrington and Norwich Museum reports are entered in the 'C' column; *The Field* is under 'E,' the Liverpool Art Gallery under 'W,' while the London Museums and Galleries are under 'W,' 'V,' 'H,' etc. Oddly enough, 'Hull' is among the H's!

A primeval Washing-day. We learn from the *Yorkshire Post's* account of the discovery of the South Pole that 'geologists have hopes that the pre-Cambrian rocks of the Polar regions may not have been subjected to that dipping into the internal lava of the earth which has melted them in other quarters of the globe, so that, on re-emerging, any fossils they may have contained have been destroyed.'

Mr. C. G. Lloyd, of Cincinnati, Ohio, has just issued a well illustrated *Synopsis of the Section Ovinus of Polyporus*,' at the end of which are the following :—'Index, distribution, and advertisements,' 'Index of the species considered valid in this publication, the countries from whence known, and the personal name to be added to the specific name *by those who believe in this system of advertisement*!'

We have just seen a newspaper report of an interview with a Lincolnshire naturalist named Webster. According to this, the best catch of snakes he ever had was when he obtained eighty-five in a bunch in a manure heap. When he was at Cowbitt, he caught two hundred and twenty in two years. 'The largest I ever caught measured 8 feet 6 inches; it was between Spalding and Crowland.' The article concludes: 'Mr. Webster's interest in natural history is not confined to living reptiles. His front room is crowded with stuffed animals, from a panther, a vulture, and a python, to a skinned and preserved flea'; all caught, we presume, between Spalding and Crowland.

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A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

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AND
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TECHNICAL COLLEGE, HUDDERSFIELD.
WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
J. GILBERT BAKER, F.R.S. F.L.S., GEO. T. PORRITT, F.L.S., F.E.S.,
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RILEY FORTUNE, F.Z.S.

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NOTES AND COMMENTS.

RELICS OF EARLY MAN.

Now that the craze for relics of early man is at its height we must expect a good deal. In the *Geological Magazine* for May, the Rev. O. Fisher, M.A., F.G.S., has a paper on 'Some handiworks of early men of various ages.' The following is one of the 'evidences' he gives:—'At one time, when I was digging for bones in the gravel at Barrington, I found two round stones of the same size near one another. One of them was a flint nodule, the other of a different rock. They attracted my attention at the moment, but their possible significance did not occur to me then, and I did not preserve them. I afterwards thought that they might have been bolas, such as are used in South America for catching game. They were of a suitable size for such a purpose.' When we have been digging for bones in the Holderness gravels, we have found round stones, some of which were flint nodules. There were cart loads of them. Their full significance did not occur to us at the time, and we did not preserve them, but we now think they may have been footballs, cricket balls, tennis balls, marbles and pills. They were of suitable sizes for such purposes. But we never previously thought they were relics of early man.

WEST INDIAN RHIZOPODS AT WHITBY.

At a recent meeting of the Linnean Society, Dr. J. Mastin made the following report:—'On the 4th September, 1911, a few days after a stormy sea and heavy wind, on the coast off Whitby, Yorkshire, I saw a little patch of beautiful irridescent colour floating on the surface of the then calm water. I skimmed this cloud of colour, and on clearing later, found it to be varieties of Polycistina, of the family Rhizopoda, but having siliceous instead of calcareous shells. These shells, which are of magnificent forms, are identical with those usually (and I am informed *only*) found in the West Indies, and along the coasts of Florida and the Gulf of Mexico. I believe they are the first discovered on the English coast to which they will most probably have been brought by the Gulf Stream.' We have not seen drawings nor even the names of these Rhizopods, but we think it very likely that they are either known in many places elsewhere than in the West Indies, or they have reached Whitby by other means than the Gulf Stream.

CLEANSING GREASY INSECTS.

Most collectors of Lepidoptera will have been inconvenienced at one time or another by their specimens turning 'greasy.' In *The Entomologist's Record* for May, Mr. P. A. H. Muschamp

describes ' an absolutely effective system ' of dealing with the matter, which may be interesting to our readers. Obtain a quart of Toluol (C_7H_8) from the druggist, and pour a quantity into each of three vessels, the size of which will depend upon individual requirements. Put two or three specimens into the first for twenty-four hours, then pass them on into the second bath, and after a day there, pass them into the third. ' Thus each has three full days of the cleaning process and comes out of his bath spick and span and wonderfully rejuvenated. No resetting is required as the bath does not in the least relax the patient.' The vessels should be covered with a piece of glass to prevent evaporation.

THE PORTSMOUTH REPORT.

For some years we have drawn attention to the delay in the appearance of the reports of the meetings of the British Association for the Advancement of Science, and we have more than once suggested that it would be in the interests of the advancement of science if the report of one meeting appeared a little earlier than on the eve of the next. Seeing that the addresses, reports of committees, abstracts of papers, the list of members, and practically everything but the index is in type at the time of the meeting, nine or ten months for repaging, indexing, and binding, has seemed, to us, rather a long while ; especially when it is borne in mind that the very value of these reports on the state of science rests in their prompt appearance. The matter has even been discussed at the Association's meetings ; but we have generally been given to understand that the earlier publication of the report would interfere with the holidays of the staff. Anyway, holidays or no holidays, we received the 1911 Report on April 26th, 1912, which is certainly a record in recent years, and we should like to congratulate the new secretary, Mr. O. J. R. Howarth, on the prompt appearance of this volume. We shall still hope that it may be possible some day to receive the report in the same year as that in which a meeting has been held.

THE HORNSEA EXPERIMENT.

It is with peculiar pleasure that we print Mr. H. B. Booth's account of the success of the Bearded Reedling experiment at Hornsea. This beautiful bird, hitherto almost extinct in Britain, cannot possibly have any ill effect upon the fauna or flora of the district ; and the appearance of numbers of these birds can only be an added charm to the mere, which is already a veritable paradise to the naturalist. It may be satisfactory to Yorkshire naturalists to know that the suggestion originated at a meeting of the Yorkshire Naturalists' Union at Hornsea

Mere in 1908, in the same way as an excursion of the Union to the Flamborough district resulted in the preservation of the peregrines at Bempton, which now form another valuable addition to our local avi-fauna.

YORKSHIRE UNIVERSITIES' MARINE LABORATORY.

The Universities of Leeds and Sheffield have recently acquired a lease of the old coastguard cottage at Robin Hood's Bay, and have fitted it up with water, gas, and work-benches for use as a marine laboratory by their students. The laboratory will be administered as an extension of the Zoological Departments of the two Universities, Professor Denny of Sheffield and Professor Garstang of Leeds acting jointly as directors. The undertaking is of an experimental nature at present, but there can be little doubt that the arrangement will meet a distinct need. Experience has shown that very few Yorkshire students can afford the time and expense involved in journeys to Plymouth or even Port Erin, and a party of ten students who made use of the laboratory at Easter, found in the simplicity of their accommodation, no hindrance to a week's successful work.

The report of the **Colchester Museum** for the year ending March 31st, 1912, contains the usual extensive list of suitable additions. There are illustrations of founder's hoards of the Bronze Age, Bronze Age and Late Celtic earthenware, bygones, etc.

The Eighty-Ninth Report of the Whitby Literary and Philosophical Society contains a list of additions during the year, a useful meteorological report, a note on 'Dentritic Markings in Rain Gauge,' and, as an appendix, 'A List of Ethnographical Collection, Antiquities, Curiosities, Specimens of Art from Semi-barbarous Countries, etc.', This includes 268 items.

The Fifty-Ninth Annual Report of the Nottingham Naturalists' Society for 1910-11, was published, as properly stated on the cover, 'Friday, May 3rd, 1912.' It contains an abstract of a paper on the 'Geological Aspects of Scenery near Nottingham,' by Dr. F. Oswald; a paper on 'The Mycetozoa of Nottinghamshire,' by Prof. J. W. Carr; 'Annelid Hunting in Nottinghamshire,' by Rev. H. Friend, and 'On the Discovery of *Anthracopalaemon* in the Nottinghamshire Coalfield,' by Dr. Moysey.

From the **Bankfield Museum, Halifax,** we have received publications Nos. 8, 9, 10, and 11. The first-named is sold at one shilling, and deals with Halifax Posts, 1684-1852, and contains illustrations of a large number of postmarks, etc. Like Nos. 9 and 11, it is by the Hon. Curator. Mr. H. Ling Roth. No. 9 is entitled 'The Introduction of Scientific Physical Culture into England,' and is sold at threepence. No. 10 is by Mr. F. Villey, and describes the Roman Remains from Slack, which are in the Halifax museum. It is well illustrated, and, like No. 11, is sold at one penny. The pamphlet on Hand Card Making is of exceptional value, and Mr. Ling Roth is to be congratulated upon having placed on record information respecting this by-gone industry; information which future investigators could not possibly secure.

THE BEARDED TIT EXPERIMENT AT HORNSEA MERE.

H. B. BOOTH, F.Z.S., M.B.O.U.

So far the experiment of the Wild Birds' and Eggs' Protection Acts' Committee of the Yorkshire Naturalists' Union in introducing the Bearded Tit (or, I think more correctly, the Bearded Reedling, *Panurus biarmicus*) to Hornsea Mere, has turned out to be an unqualified success. The conditions are ideally

The first-known Yorkshire Bearded Tit's nest, taken at Hornsea Mere on May 11th, 1912 (after the young birds had left it), and now in the Hull Museum. (Photo taken looking from above).

suitable to their habits and nesting requirements, and for many years it has been a matter of surprise that no birds of this species took up their quarters there. After some discussion among the members of this committee, Mr. Fortune's suggestion of obtaining eggs of the Bearded Tit from the Norfolk Broads and inserting them into nests of Reed Warblers at Hornsea, appeared to be the best and easiest means of trying the experi-

ment. This was, of course, subject to the necessary permission being obtained.

However, the president of the committee (Mr. W. H. St. Quintin), generously undertook to obtain several pairs of the birds from Holland, at his own expense, and to keep them for several months in his aviaries before liberating them. Notes and criticisms on this experiment have already appeared.* On April 11th, 1911, fourteen birds (eight males and six females) were liberated by Mr. St. Quintin.† They were reported occasionally after ; but unfortunately our bird-watcher at the Mere was not competent as an ornithologist, although towards the end of his engagement he stated that he had seen a pair followed by its young. This year, our watcher of the two past seasons having taken another situation, we engaged a more experienced ornithologist as bird-watcher in Mr. George Bolam, who took up his duties on April 20th, with special instructions to look out for the Bearded Tits. He immediately reported that they were in evidence, and shortly after that, three pairs at the least were feeding young at the nests.

On May 10th and 11th, the writer visited the Mere in company with the bird-watcher, and was delighted to see many Bearded Tits ; adult males and females, and also young birds, begging with quivering wings, for food from their parents. Adult males, in their beautiful characteristic plumage, predominated ; sometimes five or six being visible at the same moment, which rather pointed to some of the females being already engaged with second nests. On a previous occasion the watcher had seen eight males (curiously the exact number liberated) engaged in chasing one female. The colony now appears to be well established, and under favourable circumstances should contain not less than fifty or sixty birds at the end of the present season. Owing to the vast and almost inextricable masses of reeds, etc., at certain parts of the Mere, and the practical impossibility of getting to them, the Bearded Tit should become quite a common species there—even possibly the strongest single colony in England—and a welcome addition to this ornithological paradise.

The birds appeared to be equally as much at home as I have seen them on the Norfolk Broads and in Holland ; and their active, restless habits, together with their clear metallic 'ping ping' notes, render an additional charm to the Mere. I also noticed at Hornsea—as I have done elsewhere (although I do not remember having seen it recorded)—the peculiar Dragon-fly-like flight of a pair of Bearded Tits when in the air

* See *The Naturalist*, 1911, pp. 45, 172, 279 and 348 ; and 1912, p. 22. Also *British Birds*, Vol. V., p. 108.

† *The Naturalist*, 1911, pp. 279-280.

over the reed bed, and evidently courting. I brought away a nest from which the young had left a few days before ; and as this is the first that had actually been found by the watchers, and the first-known Yorkshire nest of what may prove a most thriving colony, I presented it to the Hull Natural History Museum. It is the characteristic nest of the species, being composed externally of flat sedges and reeds, with a thick lining of the old flower-heads of the reed stalk.

Mr. St. Quintin has visited the Mere on two occasions recently, and is naturally highly pleased and justly proud with the success of the experiment. All true lovers of wild birds in Yorkshire owe a debt of gratitude to him for his generosity, and for the time and trouble he has expended in bringing about such a successful issue, and in *really* adding such a delightful and resident species to our county's avi-fauna.

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Moths of the Months and how to identify them, by the **Rev. S. N. Sedgwick, M.A.** London : Charles H. Kelly.

This is another instance of the attempt of an author to write on a subject of which he evidently knows but little. A very cursory knowledge of the current literature on the subject, or of the doings of present-day lepidopterists, would have prevented some of the pitfalls into which he has fallen. For instance, in his instructions on ' setting,' (p. 14), he tells us that ' a large number of species are small and fragile, and only the finest pins must be used ; others are too small for pins and must be gummed on to card.' The ' finest-pin ' notion was that of forty years ago, for nowadays students use the stoutest entomological pin consistent with the size of the moth ; whilst we do not remember to have ever before heard of even the smallest moths *being gummed on to card.* Such method is used for beetles, but to adopt it for moths would be to ruin the specimens absolutely for scientific purposes. And he would be a clever boy who could name his captures from the descriptions. The complete description of *Larentia multistrigaria* is ' coloured as its name implies ' ; of *Fidonia piniaria,* ' bright brown with slight fringe of white ' ; of *Melanippe fluctuata* ' grey with brownish patches on upper wings,' and so on. Then we are told that the larva of *Cheimatobia brumata* ' feeds on hedges ' ; that of *Hybernia rupicapraria* 'on blackthorn and similar bushes,' etc. Of *Callimorpha hera* we learn that ' occasional specimens are found in England, but its chief habitat is the Channel Islands,' whereas everybody knows that for many years now it has been taken in abundance on the South Devon Coast ; then the next species to it in the book, *Deiopeia pulchella,* which is one of the very rarest of species in Britain, is noted as being ' not a very common species.' *Sphinx convolvuli* is stated to be ' rarely found in England, but once fairly common,' when, in fact, it is now no longer regarded as a rarity, and last year (1911), as in other recent years, was quite plentiful in some parts of the south of England. Of the illustrations, many of the more striking species are recognizable, but many are so blurred, that only their shape suggests what they are supposed to represent. The coloured frontispiece, representing the larvae of five of our larger butterflies and moths, is good, and is a great contrast to the figure of the larva of *Arctia caja,* which, as represented, is truly a ' fearsome beast.' Enough has been said, though allusion might be made to the almost total absence of generic names, and the not rare errors in spelling. As a cheap little book for children, no doubt it will be more or less useful, but it is a pity it has not been written on more modern lines.—G. T. P.

YORKSHIRE NATURALISTS AT RICCALL.

THE fifty-first year's field work by the members of the Yorkshire Naturalists' Union was commenced at Riccall on Saturday, May 4th, by investigating the Commons of Riccall and Skipwith. The weather was fine, though sunless, and the paucity of the April rainfall was evidenced in the dryness of the ditches and depressions by which the drainage of the Commons is carried away.

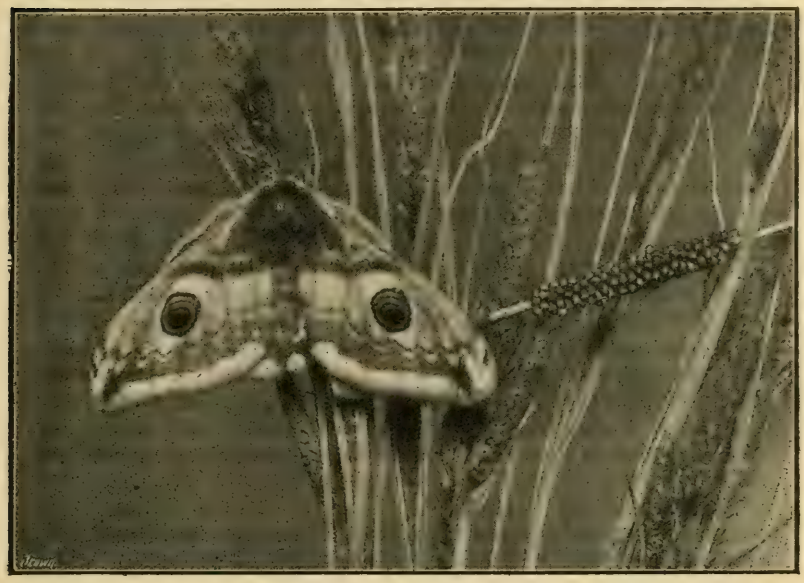

Photo by] [*A. E. Peck.*

Female Emperor Moth: Riccall Common.

Between fifty and sixty members were present, twenty of the affiliated societies being represented, and all were evidently well satisfied with the day's outing. The President, Mr. J. W. Taylor; the Treasurer, Mr. H. Culpin; and the Secretaries, Dr. T. W. Woodhead and Mr. W. E. L. Wattam, were in attendance. An apology for absence, owing to indisposition, was received from Mr. Harold Wager, F.R.S. At the general meeting held in the schoolroom at Riccall, Mr. Taylor presided, and reports on the work accomplished during the excursion were given by Messrs. H. Culpin, W. Ingham, S. H. Smith, J. F. Musham, and W. N. Cheesman. Five new members and one society were elected to membership. Hearty thanks were accorded to Lord Wenlock and Mr. Riley Briggs for the permission

granted to visit the Commons; also to the guides, Mr. W. Ingham, Rev. C. D. Ash, Dr. W. J. Fordham, and Mr. W. N. Cheesman; particularly to the latter gentleman for his great help in making the local arrangements; and also to the Rev. R. Hyde for the use of the school.

The result of the work of the sections is given in the following reports :—

Geology.—Mr. H. Culpin writes :—The route taken was from Riccall by the bank of the River Ouse to Turnhead Farm, then across the fields to the Common, and back to Riccall by the field path north of Danes' Hills. The natural bank of the river at the bend near Turnhead Farm was examined, and was found to shew several feet of coarse brown sand. On the Common and the adjoining fields there was much blown sand, some of it very fine grained. A section on the Common gave eight inches of peat on 2 feet of sand. Three small boulders were found about half-a-mile south of Danes' Hills. One was Carboniferous Limestone, one a grit with *Productus*, and one a close-grained grit without fossils; otherwise there was a remarkable absence of stones (and gravel) throughout the district traversed. The prevailing soil was loose and sandy. South of the Common some fields with a clayey soil were noticed.

Flowering Plants :—Mr. J. F. Robinson writes :—From notes made at Riccall and Common it was apparent that things were not nearly so numerous nor luxuriant as one has previously experienced in this bit—one of the very few left—of primitively wild East Yorkshire. This was undoubtedly accounted for by the recent lack of rain; and things generally did not look their brightest on this occasion for the reason that, besides being dry, it was decidedly chilly. But many plants were flowering: notably the white and red Dead Nettles, Storksbill, *Erodium cicutarium*, *Viola riviniana*, and *V. palustris*. The greater and lesser burnet, *Sanguisorba officinalis* and *Poterium Sanguisorba*, the former in foliage only, the latter with flower-buds not yet open; the three common heath plants, *Calluna*, *Erica tetralix*, and *E. cinerea*, were all seen in greater or less profusion; but with scarcely a sign of the new season's foliage as yet. Nearer Skipwith, on the side of the Common remote from Riccall, *Rumex maritimus*, and *Mentha Pulegium* were seen in their well-known station; whilst by the roadside *Bryonia dioica*, *Malva sylvestris* (with the characteristic fungal æcidia on the leaves), *Artemisia vulgaris*, etc., vegetated profusely.

Later in the evening, with Messrs. Cheesman, Culpin, and Stather, I went to the banks of the Ouse, and in a field adjacent thereto saw a marvellous growth, (it was all over the field), of crow garlic, *Allium vineale*, and of *Colchicum autumnale*, the 'crocus' which flowers in autumn (September) when the leaves

have all died off, and fruits in spring in the midst of the succulent, upright leaves. Colchicum seems to fruit well in this station.

The sundew, butterwort, *Salix repens*, with the *argentea* variety, *Orchis Morio*, etc., were brought to the meeting and reported there.

The plant associations of the areas under investigation are typically those of a heath type. *Calluna vulgaris* and *Erica tetralix* are in abundance; the general hairiness or 'incana' form of each being a very striking feature. The chief grass is the tussocky *Molinia cærulea*. There is a very little of dwarf *Vaccinium myrtillus* and plenty of *Potentilla tormentilla*. The ill-drained portions are the habitat of *Eriophorum vaginatum* and *E. angustifolium*, with immense zones of *Juncus effusus*. Near to Skipwith a fairly large area is controlled almost entirely by *Pteris aquilina*. The woods are dominated by the conifers, *Pinus sylvestris* and *Larix europæa*; seedlings of the former being frequently met with on the open Common. In addition are *Betula tomentosa*, *Salix caprea*, and *S. repens*; *Ulex europæus* of great height on the higher and drier mounds is also a conspicuous feature. In the vicinity of the drains, and the open parts of the birch-willow woods, *Epilobium angustifolium* is a most common plant, and also occurring are *Lastrea filix-foemina* and *L. filix-mas*.

Mosses and Hepatics.—Mr. Wm. Ingham, B.A., writes:—A genus of mosses well represented on Riccall Common was *Campylopus*, of which several species were seen. These were in dense tufts buried up to their apices in peaty soil, so that they were well protected against the dry April weather. The commonest species is *C. pyriformis*, which is easily distinguished by the detached leaves lying on the tufts. These leaves are blown about by the wind and each leaf has the power of producing a fresh plant. A near neighbour to this is *C. flexuosus*, a moss which is frequent on our Yorkshire Commons. A third species, *C. fragilis*, was frequently met with in our route across the common. Two other members of the genus are of considerable interest. One is *C. brevipilus*, known at once under the microscope by its narrow leaf cells having a sigmoid curve. This species was unusually fine in deep tufts. The last species found and also the rarest is *C. atrovirens* var. *muticus*. Although found by the writer on 12th March, 1897, and again on 4th April, 1901, this year it was found to be more abundant and in deeper tufts. Mr. Cheetham detected this moss in several places. As its specific name denotes, the tufts are black below and green above, and the varietal name indicates that the usual hair points of the leaves are absent. This last *Campylopus* is not recorded from any other place in Yorkshire, nor even from any other place in England.

Another rare moss which is buried in the peaty soil up to its apices is *Dicranum spurium*, easily distinguished by the pointed apex of the individual stem. This moss was repeatedly found, and many of the tufts seen were very fine with long stems. In the same habitat as the one affected by this *Dicranum* was a very rare creeping moss, *Hypnum imponens*, distinguished from a near neighbour by the golden yellow colour of the tufts. Both the above mosses once grew on Strensall Common ; but drainage has destroyed the *Dicranum*, and has rendered the *Hypnum* very difficult to find.

Proceeding further afield we came to extensive wet ground free from heather. Here was a magnificent growth of *Hypnum lycopodioides*, with stems reminding one of a lycopodium or club moss. Near this was another very rare moss, *Hypnum wilsoni* var. *hamatum*, which occurred abundantly. Both these fine mosses are golden yellow at all times, never green like most mosses ; and this is probably due to their habitat being stagnant water, for, in running water or in clear pools having an outflow, such as those on Widdy Bank Fell in Teesdale, other golden yellow mosses of the stagnant pools of the plains were found to be of a beautiful green colour.

The Sphagna or Peat Mosses are well represented in species on this common ; but owing to the long dry weather they were not much in evidence. Submerged in the pools that existed was *S. cuspidatum*, and around the borders of the pools was *S. crassicladum*. A common peat moss of the shallow water splashes was *S. rufescens*. Some of the rarer *Sphagna* and *Harpidia* seen by the writer in former years were not seen on this occasion ; their existence depending no doubt upon congenial conditions for their growth. In the deep ditch crossing the common by the tall pine trees once grew very large dark coloured plants of *S. crassicladum*, floating on the water in the ditch. On the present occasion the ditch was dry, and the fine floating Sphagnum was reduced to a very poor stranded representative.

The Hepatics or Liverworts were also interesting. Among the heather in many places the beautiful *Blepharozia ciliaris* was seen. *Fossombronia dumortieri*, which ought to have been on the bed of a ditch, had disappeared, and its place was occupied by other plants. Among the heather was *Calypogeia fissa*. On the bare peat was *Lophozia gracilis*, and by the side of sandy cuttings, *Nardia scalaris*, *Cephalozia bicuspidata*, and *Scapania irrigua* ; the last in small quantity.

Fungi.—Mr. W. N. Cheesman writes :—After despatching the parties to the common, the writer spent the day investigating the coniferous woods outskirting the common on the western side, and here were found twelve species of Mycetozoa ; one, *Comatricha elegans*, being new to the county. This species differs

from *C. obtusata* in the capillitium branching from the apex of the short columella and not from all parts of the columella as in *C. obtusata.*

In one larch wood the beautiful but destructive ascomycete, *Dasycypha calycina,* was playing havoc with the trees, quite one-third being dead or dying through its influence ; the fallen branches being completely covered with the sporophores which were humourously compared to microscopic lemon curd cheese-cakes. In another wood of *Pinus sylvestris* and *Larix* mixed, the latter trees were quite healthy and strong. About a dozen more of the true fungi were also found, most of which, like the mycetozoa, appeared to be of last year's growth. One of the gems of the day was *Mitrula laricina,* a beautiful plant with orange cap and white stem, found by Mr. A. E. Peck in moist places under the shelter of pine trees.

Prof. J. H. Priestley brought in some fine specimens of *Sclerotinia curreyana* growing on rushes.

A *Corticium,* along with a few other things, were forwarded to Mr. Crossland, who was unable to attend the excursion. The Corticium could not be satisfactorily determined, and was forwarded to Miss E. M. Wakefield, Royal Harbarium, Kew, who is making a special study of the Thelephoracea, and will report later on the Riccall specimen.

FUNGI.

Collybia tenacella.
Psilocybe ericæa.
Galera hypnorum.
,, *tener.*
Stereum hirsutum.
,, *purpureum.*
Grandinia granulosa.
Hirneola auricula-judæ.
Polystictus versicolor.
,, *abietinus.*
Polyporus brumalis.
Dasyscypha calycina.
,, *virginea.*
,, *nivea.*
Sclerotinia Curreyana.
Mitrula laricina.

MYCETOZOA.

Badhamia utricularis.
(Sclerotium stage).
Physarum nutans.
Didymium difforme.
Reticularia Lycoperdon.
Comatricha obtusata.
,, *elegans* Lister.
Syn. *Raciborskia elegans* Berl.
Trichia scabra.
,, *varia.*
,, *fallax.*
,, *Botrytis.*
Arcyria ferruginea.
,, *incarnata.*
Diachæa corticalis.

MAMMALS.—Mr. Sydney H. Smith writes :—The mole, short-tailed and water voles are fairly numerous, and there are more stoats and weasels than the keepers desire.

BIRDS.—On the date of the excursion all the winter visiting birds had departed, and only a few of the summer visitors were in evidence. This is more particularly so this spring, the majority of migratory species being very late in arriving. In spite of these drawbacks Skipwith Common proved very interesting. The colony of black-headed gulls is of course worthy of first place ; as yet they had not commenced nesting in good earnest, and there appeared to be barely more than twenty-five

per cent. of the number present that was in evidence last breeding season. In addition to the usual common species we saw several whinchats, sedge-warblers, and redstarts, all new arrivals, probably only of the previous night. A fine male wigeon was seen by Mr. E. W. Taylor. A pair of these birds has been noticed on the common during two past seasons, but whether they nest or not has still to be discovered. A pair of shoveller ducks was noticed, but may not have nested yet. There are generally five or six pairs frequenting the common. Other nests observed were those of the wild duck containing nine and eleven eggs respectively, and that of a teal with eleven eggs ; a nest of the jay discovered by the writer held the unusual number of seven eggs, four of which were pale blue in colour instead of the usual olive green.

Photo by] [*S. H Smith.*

Viper on Riccall Common.

Mr. W. Parkin reported having seen a long-eared owl in one of the woods, and finding remains of hatched eggs of that species. Other species observed were the common, yellow and reed buntings (the males of the latter species being in gorgeous breeding plumage), magpie, coot, moorhen, swift, swallow, and house martin. There were also several nests of redshanks and snipe that contained their full complement of eggs.

Mr. C. F. Procter reported that he had seen a lesser backed gull on one of the smaller ponds , and, on wading out to nests of the black headed gulls, which it had been raiding, he found over a dozen clutches disturbed, and many of the eggs destroyed by the marauder.

Reptiles.—A female viper, measuring twenty-two inches in length was found on a part of the common that had recently

been fired. This reptile was persuaded to pose for photographic purposes, with the result shewn by the accompanying picture.

Conchology.—Mr. J. F. Musham, F.E.S., writes :—Owing to the drought, and the sandy nature of the ground investigated, a careful search of the common resulted in almost a blank.

Thanks to the energy of Mr. W. Cash, however, this was partially redeemed later in the day, by securing four aquatic species in a pool near the village ; the remaining members being equally fortunate, on visiting the banks of the Ouse, the other side of Riccall, in further adding fourteen terrestrial species ; the day's results being as follows :—*Arion ater* var. *castanea, Arion minimus, Limax maximus* var. *fasciata, Hyalinia cellaria, H. nitidula, H. alliaria* (a fine colony taken in the churchyard), *H. pura* var. *nitidosa, Vitrina pellucida, Zua lubrica, Hygromia hispida, Pyramidula rotundata, Helix nemoralis, H. arbustorum, H. cantiana, Limnæa peregra, Sphærium corneum, Valvata piscinalis, Pisidium subtruncatum,* and *Succinea putris.*

Trichoptera.—A Trichopteron, obtained by Mr. Wattam in one of the pine woods, has been determined by Mr. G. T. Porritt as *Limnophilus auricula.*

Arachnida.—Mr. Wm. Falconer writes :—More members of the Arachnida Committee attended the meeting than is usually the case, yet as very close search is necessary to procure spiders, only a limited area of the common could be investigated, but this was intentionally a portion which had not before been worked for arachnids, the route selected traversing the first wood, the open damp ground beyond, and the wood beyond the second guide post. Dry conditions favoured collecting, seventy-nine species of spiders, two of harvestmen, and one pseudoscorpion, being met with. Twenty-four of these had not previously been recorded for the common ; most were common and widely distributed spiders, but the rest furnish valuable additional records for the county list, viz. :—

Argyroneta aquatica Latr. Line Ponds, two ♀s, Dr. Fordham, who had known of its presence there for some time.

Crustulina guttata Wid. Two ♀s, from heather bordering road at the second wood. A southern species, though twice noted previously in the East Riding.

Entelecara thorellii Westr. An adult pair. T. Stainforth. One ♀ previously taken in North Riding. A rare spider also elsewhere.

E. acuminata Wid. 3 ♂s, 3 ♀s, the latter not adult, from heather roots.

Tapinocyba pallens Cambr. 3 ♂s, 2 ♀s, from the woods. Omnes.

Cyclosa conica Pallas. 1 adult ♂ from second wood. Only two previous Yorkshire records; Bradford and East Riding.

Cercidia prominens Westr. 1 ♀ from bracken debris near second wood. Only two other northern records, one being for Adel Moor, near Leeds. It is not uncommon, however, in the south of England.

Epeira sturmii Hahn. Adult pair, first wood; adult ♀, second wood, with many immature examples from coniferous trees.

Where no name is attached, the spider was of my own collecting. The others new to the common are:—

Segestria senoculata Linn. 1 ♀. W.P.W.
Clubiona holosericea Degeer. 1 ♀.
Agroeca proxima Camb. 2 immature ♀s, T.S.
Hahnia montana Bl. Omnes.
Theridion denticulatum Walck. 1 ♂, 3 ♀s, W.P.W.
Linyphia peltata Wid. Omnes.
Oreonetides abnormis Bl. 1 ♀, T.S.
Agyneta decora Camb. 1 ♂.
Ædothorax fuscus Bl. 1♀, W.P.W.
Walckenaera acuminata Bl. Omnes.
Ceratinella brevis Wid. 1 ♀, W.P.W.
Pachygnatha degeerii Sund. Omnes.
Epeira cucurbitina Clerck. Immature example, T.S.
Oxyptila trux Bl. 2 ♀s, W.P.W., W.F.
Meta merianae Scop. 2 ♀s. W.P.W., W.F.
Trochosa terricola Thor. Omnes.

Of the more uncommon spiders which have been previously reported, only *Clubiona diversa* Camb., *Theridion bimaculatum* Linn., *Linyphia pusilla* Sund., *Leptyphantes obscurus* Bl., *Hillhousia miser* Camb., *Gongylidiellum vivum* Camb., *Cnephalocotes obscuris* Bl., *Enidia cornuta* Bl., and *Peponocranium ludicrum* Camb., (the last two rather freely), again occurred.

For such a promising locality (one of the best in Yorkshire), the total number of arachnids, 130, is by no means a large one, and indicates not so much what has been done, as what remains to be done, so that regular and systematic collecting cannot fail rapidly to swell the list.—W.E.L.W.

Prof. P. F. Kendall has been elected President of the Leeds Philosophical and Literary Society.

We learn from the 'latest news items' in the *Standard* that 'on the Blackwater Broads in Essex, the Flycatcher bird, a rare visitor to these shores, has been shot.'

According to the report of the Borough Librarian and Secretary to the Museum Committee of the Borough of Beverley, just to hand, the Public Library Committee at Beverley includes an assistant, an attendant, and Mr. and Mrs. Barrow, cleaners.

While stripping the dense growth of ivy from the walls of an outhouse which was not more than twenty feet by ten feet, at Selby recently, a man is reported to have obtained 210 sparrows' eggs, for which he was paid a half-penny each from the local farmer's club.

FRESHWATER RHIZOPODA AND HELIOZOA FROM KINDER SCOUT.

JAMES MEIKLE BROWN, B.Sc., F.L.S.,
Sheffield.

No records of Rhizopods or Heliozoa from the Kinder Scout district appear to have been published, and as it may be taken to represent the highest moorlands in the county, a study of the micro-fauna should prove to be of interest. During a visit made early in March, material was collected along a route following the public footpath from Edale Head, by way of Edale Cross, William Clough and Ashop Clough to the Snake Inn. This, unfortunately, does not allow of collecting being done on the Kinder Plateau itself (2000 feet).

Sphagnum and other submerged mosses and hepatics were gathered at as many points on the way as possible, so that the material may be regarded as characteristic of the district at this season. The following are the chief localities, several gatherings being taken from each :—

1. Jacob's Ladder (1500-1600 feet).
2. Kinder-low End (1600 feet).
3. William Clough (1100-1600 feet).
4. Ashop Head (1670 feet).
5. Ashop Clough (Featherbed Moss side, 1260 feet).
6. Ashop Clough (Cabin Moss side, 1100 feet).
7. Near the Snake Inn (1070 feet).*

All these localities are on the Limestone Shales (Yoredale Rocks), and it is an interesting question whether the geological nature of the locality has any direct influence upon the Rhizopod fauna. It certainly seems true that the Carboniferous Limestone districts are less rich than the Gritstone, Granite and similar areas which I have examined, but it will probably be found that the influence is indirect, and depends mainly upon the vegetation rather than directly upon the geological character.

From the point of view of vegetation, the collecting grounds 1 and 7 are classed as Siliceous Grassland, 2 and 3 as Bilberry Moor, and 4, 5, and 6 as Cottongrass Moor,† but on comparing the lists given below, no great distinction can be drawn between the faunas of these associations ; the Cottongrass Moor shews, however, a slightly greater number of species (49), the Bilberry Moor comes next (38), while the Siliceous Grassland shews the least (26).

* Heights are approximate.

† See ' Types of British Vegetation,' Ed. Tansley, 1911, p. 274.

1912 June 1.

LIST OF SPECIES.	JACOB'S LADDER. 1	KINDER-LOW END. 2	WILLIAM CLOUGH. 3	ASHOP HEAD. 4	ASHOP CLOUGH (FEATHERBED). 5	ASHOP CLOUGH (CABIN MOSS). 6	SNAKE INN. 7
I. RHIZOPODA.							
AMOEBINA.							
Amoeba vespertilio Penard					×		
,, *limax* Dujardin	×		×	×	×		
,, *limicola* Rhumbler	×	×					
Dactylosphaerium radiosum (Ehrenb.) Bütschli	×			×			
ARCELLINA.							
Pseudochlamys patella Clap et Lach.						×	
Pyxidicula sp.		×	×				
Arcella vulgaris Ehrenb.					×		
,, *hemisphaerica* Perty		×				×	
,, *catinus* Penard				×			
Centropyxis aculeata (Ehrenb.) Stein	×	×	×	×			
,, *laevigata* Penard			×				
DIFFLUGINA.							
Difflugia oblonga Ehrenb.	×	×	×	×	×		
,, *bacillifera* Penard				×			
,, *rubescens* Penard			×		×		
,, *penardi* Hopk.					×		
,, *pulex* Penard			×				
,, *globulus* Ehrenb.							×
,, *constricta* (Ehrenb.) Leidy.	×	×	×	×	×		×
Pontigulasia vas (Leidy) Schout.			×	×			
,, *compressa* (Carter) Cash.			×	×			
Cryptodifflugia oviformis Penard	×	×	×		×	×	
,, *eboracensis* Wailes			×				
Phryganella hemisphaerica Penard					×		
,, *nidulus* Penard					×		
NEBELINA.							
Hyalosphenia papilio Leidy					×		
Nebela collaris (Ehrenb.) Leidy.		×	×	×	×		
,, *tincta* (Leidy.) Awerintz.	×	×		×	×	×	
,, *tubulosa* Penard	×	×		×	×		
,, *flabellulum* Leidy	×			×	×	×	
,, *militaris* Penard	×			×		×	
,, *tubulata* Brown	×	×					
,, *dentistoma* Penard	×	×	×		×		
,, ,, var. *laevis* Hopk.	×						
Quadrula symmetrica (Wallich) Schulze		×	×	×	×	×	
Heleopera petricola Leidy			×				
,, *rosea* Penard	×	×	×	×	×		

LIST OF SPECIES—*contd.*	JACOB'S LADDER. 1	KINDER-LOW END. 2	WILLIAM CLOUGH. 3	ASHOP HEAD. 4	ASHOP CLOUGH (FEATHERBED). 5	ASHOP CLOUGH (CABIN MOSS). 6	SNAKE INN. 7
EUGLYPHINA.							
Pamphagus granulatus (Schulze) Penard		×			×		
Capsellina timida Brown		×			×		×
Euglypha alveolata Dujardin			×				
,, *ciliata* (Ehrenb.) Leidy	×			×			
,, *strigosa* (Ehrenb.) Leidy		×		×		×	
,, *compressa* Carter					×		
,, *filifera* Penard					×		×
,, *denticulata* Brown	×			×			
,, *laevis* Perty		×	×		×		
Assulina seminulum Leidy				×			
,, *muscorum* Greeff				×	×		
Cyphoderia ampulla (Ehrenb) Leidy					×		
,, ,, var. *imbricata** Penard				×			
?*Campascus minutus* Penard				×			
Sphenoderia lenta (Ehrenb.) Leidy			×				
,, *fissirostris* Penard			×	×	×		
,, *dentata* Penard		×	×				×
Trinema enchelys (Ehrenb.) Leidy	×	×	×	×	×	×	×
,, *lineare* Penard	×	×		×	×	×	×
,, *complanatum* Penard				×			
Corythion dubium Taranék	×	×	×	×	×	×	
,, *pulchellum* Penard	×	×	×	×			
AMPHISTOMINA.							
Amphitrema stenostoma Nüsslin			×	×			
II. HELIOZOA.							
Actinophrys sol Ehrenb.		×	×	×			
Actinosphaerium eichhornii (Ehrenb.) Stein			×				
Acanthocystis pertyana Archer		×	×	×	×		
Raphidiophrys pallida Schulze	×						

The submerged 'moss' material was particularly poor in species and in individuals; the *Sphagnum* was distinctly richer, yet compared with similar collections which I have made elsewhere, could not be considered very prolific in forms.

Some species which are usually common in upland bogs, and which one might have expected, such as *Placocysta spinosa*,

* Recently renamed by Mr. Wailes as *C. trochus* var. *amphoralis* in 'Proc. Roy. Irish Acad.', XXXI., 1911.

Ditrema flava, Amphitrema wrightianum, were entirely absent from the material examined ; while *Sphenoderia lenta, Assulina seminulum, Amphitrema stenostoma* occurred in only one or two gatherings, and then in very small numbers.

Hyalosphenia papilio, though plentiful in No. 6, was absent from the rest of the material, and, so far as I have been able to notice, it is generally a rare species in North Derbyshire and South Yorkshire,* though common in Scotland,† the Lake District and elsewhere.

Nebelas were not as plentiful as is usual in sphagnum. Typical *N. collaris* was represented by only a few individuals, *N. tincta* and *N. flabellulum* occurred in larger numbers, while *N. tubulosa* was quite common in those gatherings in which it occurred. *Heleopera rosea* was fairly common, to the exclusion of *H. petricola.* It is one of those species which seems more abundant in upland regions (see below).

Capsellina timida and *Euglypha denticulata*‡ are less conspicuous species found in moss. The records of these forms add to their known distribution.

Pyxidicula sp. This species somewhat resembles *P. invisitata* Awerintz, but differs in some important respects. Without further study, I hesitate to describe it as a new species, and this applies, also, to a Nebela found associated with *N. tubulosa.*

On comparing the above records with those obtained from Scotland (q.v.) the Lake District and elsewhere, it would appear that the following species generally occur more plentifully in upland bogs than in similar situations at lower levels, though in what way they may be adapted to greater altitudes is difficult to imagine.

Nebela carinata§	*Heleopera rosea*
,, *marginata*§	*Placocysta spinosa*§
,, *flabellulum*	*Amphitrema stenostoma*
Hyalosphenia papilio	,, *wrightianum*§

More exact records on this point are required, however, before very definite conclusions can be drawn.

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* See ' Freshwater Rhizopods from the Sheffield District,' ' The Naturalist,' 1910, p. 92.

† See ' A contribution to our knowledge of the Freshwater Rhizopoda and Heliozoa of Scotland,' ' Ann. of Scot. Nat. Hist.', 1911, p. 228.

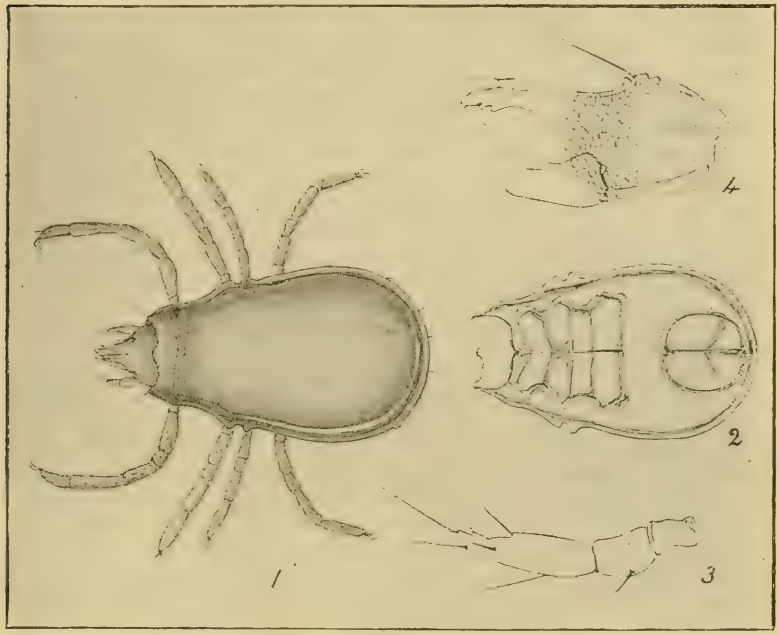
‡ Recently described and figured in ' The Scottish Naturalist,' 1912, p. 111, plate V.

§ Absent from the Kinderscout material.

SOME BRITISH EARTHMITES.

C. F. GEORGE, M.R.C.S.,
Kirton-in-Lindsey.

Labidostomma luteum Kramer, a curious and very beautiful mite, was described by Dr. P. Kramer in the ' Erstes Heft ' of the ' Archiv fur Naturgeschichte ' for 1879, with some good figures. As it was so very different from any known genus of mites, he called it *Labidostomma,* and on account of its beautiful orange yellow colour, gave it the specific name *luteum.* It was



***Labidostomma luteum* Kramer.** (× 60).

1.—Dorsal aspect.
2.—Ventral ,,
3.—Palp.
4.—Mandible.

subsequently minutely described by A. D. Michael, F.L.S., in a paper published in the ' Journal of the Quekett Microscopical Society ' for August 1880 (Vol. VI., page 107). He found it in moss, in the Spring of 1878. I found it on May 3rd, 1879, in moss, and circulated a specimen in the Postal Microscopical Society, and my short notes were printed in that society's journal for 1883, page 245. Since that time I have not met with it until February last, when I found a single specimen in mites kindly sent to me by Mr. Musham of Selby,

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who obtained them at Heighington, near Lincoln. I sent this mite to Mr. Soar, together with one or two of my old mounts, from which he has made the very characteristic drawings reproduced herewith. I think that few microscopic mounts exist in England, as I have never heard of any one but Mr. Michael and myself noting it. Mr. Banks, of the United States National Museum, does not mention it in his 'Treatise on the Acarina or Mites, 1904.' The beauty of the mite could hardly be shewn except by coloured drawings taken from the living creature. I hope at no very distant date to send a mounted specimen to the Hull Museum, where my other specimens are, but as I am by no means an adept at mounting, it will not be such as I could wish it to be, but will serve for examination by any student of the Acari who is sufficiently interested in the matter to take that trouble. Having been found in two districts in Lincolnshire, no doubt it will be found elsewhere.

I would strongly advise those interested to read Mr. Michael's paper, which gives a minute description. It is written in English, and is fairly accessible.

How Sealskins are obtained, by **Joseph Collinson,** is a pamphlet sold at twopence by the Animals' Friend Society, York House, Portugal Street, W.C. It is not pleasant reading.

The Gardener and the Cook, by **Lucy H. Yates.** 260 pp., illustrations, 1912 (Constable), 3/6.

This is a delightful book for the amateur—whether cook or gardener—but for the professional of either calling of little value. There are books innumerable on the flower garden, but very few on the kitchen garden; this one relates, with a strong vegetarian bias, the story of a poetical mistress, who says 'let there be beans,' and there were beans; an immaculate Cook (one longs for a catastrophe to occur in her kitchen), who is of wonderful culinary skill; of a Gardener, one Charlemagne; and last and least, The Better Half—which by the way is a most objectionable term—the husband, who appears to be just a comfortable mole who is fed when necessary. Heaven forbid that many houses and gardens should be run by two such immaculate persons as this cook and gardener. It is a curious thing that amateur gardeners, especially amateur women gardeners, invariably appear to suffer from that irritating complaint—an excess of superior theoretical knowledge. They always triumph over the ordinary being, who has only had practical experience; the gardeners they portray are generally crusty, ill-tempered old fellows, living solely for the purpose of growing cabbages. There is a sort of dining-room culture about this book, in fact, it is full of hints as to the replenishing of the still-room and is in reality a book of recipes. The fruits and vegetables grown in this garden are those which a discerning man grows for his own eating, and are unlike those recommended by gardening manuals as suitable to be grown 'for market purposes.' The writer has a most aggravating habit of using French phrases, than which nothing is more detestable, especially when there is an English equivalent. 'Now that Spring's in the world again,' it is refreshing to read of delectable and appetising salads; and we recommend its perusal to those suffering from loss of appetite, as after reading it one has a longing to taste some of the delightful-sounding dishes, salads, and sauces, the secrets of which are revealed by the wonderful Charlotte. The book is well printed, with some charming pen and ink sketches.—F.

PLANER'S LAMPREY NEAR SCARBOROUGH.

W. J. CLARKE, F.Z.S.,
Scarborough.

DURING the latter half of April a considerable migration of this interesting little fish has taken place in the waters of the Upper Derwent at Forge Valley and Hackness, near Scarborough. On April 15th, numbers of them could be seen swimming up stream near the surface of the water, and others were observed on the 16th, 19th, 23rd, 24th, and 29th; after which date, only a single specimen was noticed. All the individuals captured were adults, probably making their way up stream for the purpose of depositing their spawn. The usual length was about five and a half to six inches, very few exceeding the latter size. *Lampetra planeri* may be distinguished from its larger relative the River Lamprey (*Lampetra fluviatilis*) by the close contact of the first and second dorsal fins, which are separated in the larger species, and also by the presence on the circular lip of numerous papillæ, from which it has taken the name of Fringe-lipped Lamprey. Specimens from the south reach a length of eight or nine inches, the females being a little larger than the males; but northern examples do not usually exceed six inches. The Lampreys are remarkable for undergoing a metamorphosis from a larval form to the adult stage, which has been carefully worked out in the case of Planer's Lamprey. In the larval state, which takes three years to complete, the sucking disc is imperfect, and has not the power of adhesion found in the adult.

The eyes are very small, and almost hidden in a fold on the skin; there are no teeth; and there are important intestinal differences. In the fourth year the change to the perfect form takes place, and occupies about ten days. There is no increase in size, but rather the reverse, the perfect form being smaller than the larva owing to the shortening of the intestinal canal. At this time a separate respiratory tube is acquired, teeth appear, the eyes are much enlarged, and the lips are formed into a complete sucking disc. The larva, not having the power of clinging to stones like the adult, lives buried in the mud at the bottom of the stream, and has been described as a distinct species under the names of Mud Lurker, Mud Lamprey, Sand Pride, and Pride. It is described under this name in the 'Vertebrate Fauna of Yorkshire' as occurring in the rivers of our county, but no mention is made of the adult form.

I noticed an example quietly swimming up stream a few inches from the bank where the current was not so strong, when a trout made a dash at it, but missed. The frightened fish darted to the bank and threw itself out of the water. The trout, disappointed of its prey, after cruising about for a few moments, left the place; but the lamprey lay upon the moist earth for probably ten minutes before it re-entered the water and continued its journey up stream.

In Memoriam.

F. M. BURTON, F.L.S., F.G.S.
(1829—1912).

We are sorry to have to record the death, on May 17th, of Frederic Merryweather Burton, at his residence, Highfield,

Gainsborough. Though considerably handicapped through the loss of his right arm as a result of a shooting accident, Mr. Burton successfully practiced as a solicitor, and from 1859 to

1902 he was Registrar of the Gainsborough County Court. He was educated at Rugby, and early in life took a keen interest in natural history, particularly botany and geology. So long ago as 1866 he drew attention, in a communication to the Geological Society of London, to an exposure of Rhaetic rocks in the railway cutting at Gainsborough ; and in *The Naturalist* for 1903 he recorded the presence of the same beds in a deep boring at Lincoln.

He was a frequent contributor to our journal, and in 1895 wrote ' The Story of Lincoln Gap ' in the November number. In the previous year he printed a paper on ' How the Land between Gainsborough and Lincoln was Formed ' ; and these two, together with additional information, formed a little book on ' The Shaping of Lindsey by the Trent,' which was published by Messrs. A. Brown & Sons in 1907, and noticed in this journal at the time. In more recent years Mr. Burton took a keen interest in the erratics found in his county, and communicated a number of notes on the subject to *The Naturalist.* In connection with this work he paid a visit to the Yorkshire coast, and the writer well remembers the rate at which Mr. Burton was able to walk on the sands from Withernsea to Spurn.

Mr. Burton took a keen interest in the Lincolnshire Naturalists' Union, and occupied its presidential chair in 1894-5. He frequently attended its meetings, and rarely was so happy as when conducting a party over ground he knew so well. He took a prominent part in the formation of the County Museum at Lincoln.

Mr. Burton was an ardent angler and an enthusiastic horticulturalist, and his gardens at Gainsborough were well stocked with rare Alpine and marsh plants. He had also a valuable collection of orchids.

He was twice married ; his eldest son is the vicar of Banbury, and his younger son is vicar of Christchurch, New Zealand.

Some little time ago the Lincolnshire Naturalists' Union published an account of Mr. Burton's work, in its Transactions, to the editor of which we are indebted for the loan of the accompanying block.—T. S.

Hutchinson's Popular Botany: the Living Plant from Seed to Fruit, by **A. E. Knight** and **Edward Step.** This is apparently a new edition of ' The Living Plant,' by the same authors published a few years ago. In the present work many of the crude text figures of the earlier work have been omitted, and numerous photographs have been added, most of which are excellent. The work, which is written in an attractive style, is to be completed in eighteen parts at 7d. each, and will contain 1000 illustrations, some of which are coloured. Being printed on art paper, full justice is done to the photographs which form a striking and pleasing feature.

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(*Continued from page 160*).

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——: o :——

According to the daily press, Cottingham is the proud possessor of a 'polyoviferous' duck.

We learn from a Yorkshire weekly newspaper that 'Olive Drew found a thrush's nest containing several eggs, in Mr. Brumfield's field on Tuesday, and the scholars of the Council School are thus afforded another opportunity of observing the hatching and rearing periods in conjunction with their nature study lessons.' Poor thrush!

FLOWERING PLANTS.

Early Flowering of the Hawthorn.—On the 29th of April I saw a spray of May blossom. I do not remember seeing any in April previously, and in this district it is more often June than May before it flowers; but the first few days in May this year produced a good many sprays of the blossom.—R. FORTUNE.

LEPIDOPTERA.

Green Hairstreak Butterflies near Scarborough.—Enormous numbers of Green Hairstreak Butterflies (*Callophrys rubi*) are to be found on the Moors near Scarborough. They are evidently well established, and in some places many hundreds can be seen within a very short radius. Although May and June are said to be the months for the Butterfly, yet they were flying in this district about the first week in April, which is a very early date.—HARRY WITTY, Scarborough.

FISHES.

***Cottus bubalis* at Scarborough.**—A remarkably fine specimen of the Common Fatherlasher (*Cottus bubalis*) was caught off the pier at Scarborough, on May 14th. It measures exactly twelve inches in length, and weighed, the day after capture, and when very dry, 1 lb. ½ oz. In 'Yarrell's British Fishes' the usual length is given as from six to ten inches. The largest specimen I have previously seen is one which I have preserved, and which was also caught from the Scarborough Pier, on February 18th, 1896; this measures ten inches in length and weighed ¾ lb.—W. J. CLARKE.

VERMES.

***Piscicola geometra* at Scarborough.**—While fly fishing recently in the Derwent at Forge Valley I caught a trout which had attached to its side, near the pelvic fins, a small greenish leech about one inch in length. I sent this while still alive to Mr. W. A. Harding, F.Z.S., of Histon, who kindly identified it as *Piscicola geometra*. In Mr. Harding's work on 'The British Leeches' is the following account of this species:—*Piscicola geometra* is widely distributed in Europe and not uncommon in the British Isles. It attacks probably most of our species of fresh-water fishes. It attaches itself firmly by the posterior sucker to some convenient object, and, stretching itself out like a rod and swaying its body to and fro, lies in wait for its prey. With the anterior sucker it strikes at, and fixes upon any passing fish with remarkable speed and precision, and letting go its hold posteriorly is carried off attached to its victim. It remains upon its host for some days, drawing blood chiefly from the fins, and drops off when gorged. The process of digestion is comparatively short.—W. J. CLARKE.

NEW NATURAL HISTORY BOOKS.

At this time of the year there is usually a good crop of books dealing with the various and numerous branches of natural science; and it is refreshing to find that each year sees a great improvement in the books as a whole, and individually they are of a higher standard of excellence. The publishers, for the most part, have found out that a few photographs of cuckoos and cuckoo-flowers, tacked together by talky-talky nonsense, do not constitute books that will sell. With being so frequently 'sold' in this way they have become careful. The books before us are all of the kind that one reads and then puts on the shelves for future reference.

The first among them is on **Reptiles, Amphibia, Fishes, and Lower Chordata,** by **R. Lydekker, J. T. Cunningham, G. A. Boulenger** and **J. Arthur Thompson.** (Methuen & Co., 510 pp., 10/6 net). It is a companion volume to Pycraft's 'History of Birds,' issued by the same firm some little time ago, and is in every way as excellent. The names of the authors alone are a guarantee of the scientific value of the contributions. The chapters are also all written from the point of view of evolution, and we feel that Mr. Pycraft is not at all exceeding the true estimate of their worth when he opines that they will be a landmark in the annals of zoological literature. We do not remember the ground being so thoroughly and so conscientiously covered previously. The very existence of the primitive animals described by Prof. Thomson is unsuspected by most of us. The student of sociology will find in his chapters, no less than in those concerning more familiar creatures, much food for reflection bearing on the subjects of adaptation to environment, degeneration, and so on. To those who seek to discover the subtle and mysterious factors which govern the transformation of animals, will find much food for thought in Mr. Lydekker's account of the reptiles, and in the chapters on the nursing habits of amphibia and fishes by Mr. G. A. Boulenger and Mr. J. T. Cunningham; and to these we would add the weird and fascinating chapter on the fish-life of the abysses of the ocean, a world wherein the light of day never penetrates, and where the pall of night is broken only by the pale phosphoresence emitted by the creatures doomed to dwell there. The illustrations are all that can be desired, some being coloured.

A Catalogue of the Vertebrate Fauna of Dumfriesshire has been prepared by **Mr. Hugh S. Gladstone,** and 250 copies only have been printed, and are for sale by Messrs. Maxwell & Son, of Dumfries. (80 pp., and map). In addition to an admirable introduction, the volume contains particulars of the mammals, birds, reptiles, amphibians, and marine and freshwater fish. The book is bound so as to match 'The Birds of Dumfriesshire' by the same author.

A subject usually neglected by ornithologists has been dealt with by **Mr. F. W. Headley,** in his volume on **The Flight of Birds.** (Witherby & Co., 5/- net, 163 pp.). Those who are familiar with the leading zoological journals will have seen Mr. Headley's interesting contributions from time to time. In the present volume the substance of them all is included, in addition to which there is much new matter. There are nine chapters in the book, dealing with Gliding, Stability, Motive Power, Starting, Steering, Alighting, Machinery of Flight, Varieties of Flight, Pace and Last, Wind and Flight, and Some Accessories. Throughout the work the author compares the birds with aeroplanes; and in many ways, other than that of natural history, will the book be found to be useful.

Lectures in Biology, by **Dr. Curt Thesing,** translated by **W. R. Boelter.** (London: Bale, Son & Danielsson, 334 pp., price 10/6). This volume contains a series of lectures delivered at the Humboldt Academy and the Urania in Berlin. They are entitled, 'From Thales to

Lamarck,' 'Phenomena and Conditions of Life,' 'The Forces in the Organism,' 'The Building Stones of the Organic World,' 'The Origin of Life,' 'The Evolution Theory,' 'The Factors of Evolution,' 'The Conservation of Life,' and 'Reproduction and Heredity.' The book is well illustrated, some of the plates being in colours. The object of the volume, however, is to shew that it is no longer possible, having regard to the advances of modern research, to find complete satisfaction in being an out-and-out believer in the Darwinian or Lamarckian or any other theory. The factors which the different doctrines assume to be at work in the genesis and evolution of the organic world are, in the author's opinion, not exclusive, for the Theory of Selection, the Doctrine of Adaptation and of Use and Non-use, and finally De Vries' Theory of Mutations, offer each for a certain section of organic evolution a sufficient and satisfactory explanation.

The Migration of Birds, by **T. A. Coward.** (Cambridge, 1912, 137 pp., 1/-). This is one of the admirable and well-bound 'Cambridge Manuals of Science Series,' issued from the Cambridge University Press. Our readers are already familiar with Mr. Coward's work, and in the present little volume he has prepared an excellent summary of the difficult question of migration, dealing with it from its various aspects. To shew the thorough way in which the subject is handled, we quote the following sub-headings to one of the eleven chapters: 'Direction of Passage,' 'The Potentiality of Flight,' 'Habit of Wandering,' 'Memory,' 'Extension of Range,' 'Influence of Temperature,' 'Desire for Light,' 'Glacial Epoch,' 'Food Basis,' 'Sexual Impulses,' 'Competition.' We strongly recommend our readers interested in ornithology to purchase this cheap volume.

Earthworms and their Allies, by **F. E. Beddard.** (150 pp., 1/-). This is in the same series as the preceding volume, and is similarly well produced. As will have been noticed from the pages of 'The Naturalist,' the study of a neglected branch of natural history, viz.: the earthworms, has recently been revived, and many important additions to our knowledge have been recorded in these pages and elsewhere. The volume principally deals with the question of the geographical distribution of earthworms, though in order so make this question better understood, Mr. Beddard has prefaced his remarks by an excellent anatomical and zoological summary, illustrated by diagrams. The volume refers to nearly all the usually admitted genera of worms, particularly of the terrestrial forms, which at present appear to be the more important in considering the question of geographical distribution.

Aristotle's Researches in Natural Science, by **T. E. Lones.** London: West, Newman & Co., 1912. 274 pp., 6/- net.

There is no doubt that, as the author of this volume points out, much is said and much more has been written at different times and in different places, in reference to Aristotle's scientific work; in fact, a formidable list of treatises on the subject is enumerated. But there is still room for a single volume, re-examining his statements as far as possible by first-hand research, and utilising the work of previous investigators. Dr. Lones summarises the nature and value of Aristotle's researches in subjects now considered to belong to physical astronomy, meteorology, physical geography, physics, chemistry, geology, botany, anatomy, physiology, embryology and zoology. In that part of the work relating to anatomy, etc., the author has tested Aristotle's statements as far as possible. We must say that Dr. Lones appears to have thoroughly and conscientiously studied the very large subject he now so well summarises.

The Ox and its Kindred, by **R. Lydekker.** (271 pp., 6/-. Methuen & Co.). In view of the interest that has arisen in connection with British wild cattle, etc., and the notes thereon which have appeared in "The Naturalist," we have every confidence in recommending Mr. Lydekker's

remarkably cheap book to our readers. Though it deals with the ox from the point of view of the naturalist, antiquary, breeder and sportsman, the extinct wild ox is obviously the main theme of the book. The book opens with a useful discussion on the names of the ox and its ancestors, and is followed by a careful description of its zoological position and structure. Mr. Lydekker deals very fully with the question of the extinction of the European ox, which occurred during the middle ages, the last refuge being a Polish forest. Personally we look upon this as the most valuable part of the book. That it is adequately illustrated is what we might expect in a book written by a gentleman who has such ready access to the national collections.

Wimbledon Common, by **W. Johnson.** (London : Fisher Unwin. 304 pp., 5/- net). It is always a pleasure to read an account of a particular area from its geological, antiquarian, natural history and historical points of view ; and when an author is sufficiently versatile to be able to write on all these points himself, the pleasure becomes the greater. In the present work Mr. Walter Johnson has covered the whole ground well ; and what there is to be known of Wimbledon Common is surely in this volume. We have previously referred to Mr. Johnson's work in these pages, and always with pleasure. In the present book reference is made, in fourteen chapters, to the physical geography and geology, streams, springs, ponds, pre-historic times, early and mediæval history, the fauna and flora from various points of view ; and there is an excellent bibliography and index. The book is well illustrated by maps and photographs ; among the latter, Yorkshiremen will be interested in the view of Lauriston House, Wimbledon Common, where ' the boy William Wilberforce lived for some time with his uncle, and in 1777 returned as owner of the mansion.'

Wild Flowers as they Grow. Photographed in colour direct from Nature by **H. E. Corke,** with descriptive text by **G. C. Nuttall.** Third series. Cassell & Co., 1912. 200 pp., 5/- net. This is the third volume in the wonderfully illustrated series of botanical books, to two of which we have previously drawn attention in these pages. The present volume is in every way equal to its predecessors. Of the illustrations it is difficult to say which me admire the most ; though the Honeysuckle, the Field Rose, the Bramble, and the Peppermint, are perhaps the best.

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We have received the **Report on the Present Condition of the Bardney Abbey Excavations for the year 1911,** which shews that excellent progress has been made by the Vicar, the Rev. C. S. Laing, and his willing helpers.

Cruelties in Dress, by **Jessey Wade,** is the title of a pamphlet issued by the Animals' Friend Society, York House, Portugal Street, Kingsway. (2d.). It points out the nature of the cruelties practiced in order to bedeck ladies with fine feathers and furs.

Mr. S. L. Mosley, of Huddersfield, is issuing privately to subscribers only, **An Account of the Birds of the Huddersfield District,** with 40 crayon-watercolour plates (a new hand process), and 40 distributional maps illustrating all the common kinds. Part I. contains coloured illustrations of the Rook and Magpie, with maps, etc.

From the Agricultural and Horticultural Association, London, we have received two pamphlets. The first, **Window Gardens,** by **T. W. Sanders,** is sold at one penny, and deals with the subject referred to in the title, in all its branches. The second is the **One and All Gardening Annual for 1911,** and is sold at twopence. It contains articles on Port Sunlight, Shore Gardens, Violets, the Birds of the Air, Intoxicated Plants, etc. What appears to be a photograph of sun spots, on page 101, is labelled ' Hiving a swarm of bees under difficulties.'

PROCEEDINGS OF PROVINCIAL SCIENTIFIC SOCIETIES.

The Journal of the Chester Archæological Society, Vol. XVIII., contains an account of 'Parkgate: an old Cheshire Port,' and 'An Ancient Boat in Baddiley Mere,' by the Ven. E. Barber. Both are well illustrated.

The Seventy-Eighth Annual Report of Bootham School Natural History, etc., Society is to hand, and has been carefully compiled and well edited. There is every evidence of the school doing excellent work in natural science. We can find nothing wrong with it, not even misprints.

Vol. XI. of the **Bulletin of the Geological Institution of the University of Upsala,** edited by H. Sjogren, contains many valuable papers, some of which are printed in English. Among them are 'On the Geological Structure and History of the Falkland Islands,' by T. G. Halle, and 'Notes on some Fish Remains from the Lower Trias of Spitsbergen,' by Dr. A. Smith Woodward. Some of the latter are described as new. There are many maps and plates.

The papers of interest to naturalists in the **Memoirs and Proceedings of the Manchester Literary and Philosophical Society,** Vol. LVI., Part I., are on 'Researches on Heredity in Plants,' by Prof. Weiss; on a collection of Arachnida and Chilopoda from Rhodesia, by S. Hirst; 'Intensive study of the scales of three specimens of Salmon,' by Philippa C. Esdaile; 'Observations upon the improvement of the Physique of Manchester Grammar School Boys during the last thirty years,' by Dr. Mumford; 'The Duration of Life of the Common and Lesser Shrew,' by L. E. Adams; and a Note on the Little Owl and its food, by T. A. Coward.

The Annual Report of the Proceedings under Acts relating to Sea Fisheries for the year 1910 (cviii.+194 pp., 2-3) has been issued by the Board of Agriculture and Fisheries recently. It contains a mine of information relative to the fishing industry of this country, and while it is necessarily largely written from the economical standpoint, it contains much information of interest to naturalists. It is pleasing to observe that the Board makes grants to the Zoological Department of the University of Liverpool (£200), and to the Armstrong College (£100), in aid of fishery research.

The Annual Report of Proceedings under the Salmon and Freshwater Fisheries Acts, etc., etc., for the year 1911, came to hand from the Board of Agriculture about the same time. It consists of xvi.+55 pp., and is sold at 3½d. It contains carefully compiled reports for each of the districts in England and Wales, and useful information in reference to the captures, etc., of the various kinds of freshwater fish. One wonders how the 'estimated' number of salmon caught is arrived at, particularly in Yorkshire, where we learn that during 1911, exclusive of the Esk, 421 salmon were caught by net and rod, weighing 4735 lbs.

The Report of the Corresponding Societies' Committee and of the Conference of Delegates held at Portsmouth is to hand (35 pp., 1/-), and can be obtained at the offices of the British Association, Burlington House, W. It contains Prof. J. W. Gregory's address. As a result of the discussion in reference to the best way of classifying natural history records, the committee has agreed to the Watsonian Vice-County system, as was advocated by the delegate appointed by the Yorkshire Naturalists' Union when the matter was brought up a year or two ago. The discussion is given on Mr. H. Wager's paper on 'The Study of Fungi by Local Natural History Societies,' which was printed in extenso in 'The Naturalist'; there is a report of a discussion opened by Sir Daniel Morris on 'Co-ordination of the work of Local Scientific Societies,' and of a discussion on 'The Protection of Plants,' opened by Mr. W. M. Webb. The report also contains the usual useful list of papers which have appeared in the various publications of the corresponding societies, classified according to subjects.

NEWS FROM THE MAGAZINES.

The Museum News (Brooklyn) for March, contains an interesting note on the black rat, and its origin.

Mr. C. Mosley gives his 'Impressions of Hagenbeck's Zoological Gardens' in *The Animals' Friend* for May.

Part IV. of *Cassell's Nature Book* contains a charming object lesson on 'The Romance of a River,' by the late Joseph Lomas.

Mr. E. A. Martin has some notes on Ponds in Agricultural Districts, in the *Journal of the Board of Agriculture*, Vol. XIX., No. 1.

Some brief notes on 'Lepidoptera at Grassington in 1911' and 'Collecting in Westmorland,' appear in *The Entomologist* for May.

The Journal of the Manchester Geographical Society (Vol. XXVII., Part 1), contains papers on the Panama Canal, the Sudan, and northern Persia.

In Volume XI., part 2, of *Records of the Past* (Washington, D.C.), Mrs. Adelaide Curtiss has an admirably illustrated paper on 'The Venerable City of York.'

In *The Zoologist* (No. 850) Mr. J. M. Charlton describes the birds of south-east Northumberland, and Mr. E. B. Dunlop has a lengthy paper on the Large Larch Sawfly.

A new pose for nurses. In the *Animals' Friend* (Vol. XVIII, No. 7) is a photograph of a bird standing on the chest of a sleeping baby: it is entitled 'The Bird as Nurse.'

We are agreeably surprised to find the editors of *British Birds*, in the May issue, state that 'to regain a former breeding species, or to gain a new one, is of far greater interest and value than to discover a new "straggler."'

In *The New Phytologist* (Vol. XI., No. 4), Mr. H. Hamshaw Thomas has a useful paper 'On some methods in Palaeobotany,' and Mr. J. R. Weir gives a 'Review of the Characteristics of the Uredineae,' a subject dealt with by R. H. Philip recently in *The Naturalist*, though his paper does not appear in Mr. Weir's bibliography.

According to the local press 'a seal was caught in the Grimsby fish-dock recently. It is supposed to have floated from the Arctic regions on an ice-floe which was melted in the warmer waters of the North Sea. Thence it must have got into the muddy waters of the Humber.' We suppose it could not have come from the Wash, a few miles away, where seals breed in great numbers?

In *The Zoologist* for May Messrs. L. E. Hope and D. L. Thorpe contribute natural history notes in the Carlisle district during 1911. There is also a record of *Trichoniscoides sarsi*, a wood louse new to Britain, found under small stones on the clay cliffs near Whitby. Previously it has only been recorded for the Christiania district. There is likewise a record, apparently the first, of the Whiskered Bat in Westmorland.

In the *Museums Journal* for May, Dr. H. S. Harrison gives 'Notes on one kind of Museum,' in which he states that 'The chief function of a museum is the education of its curator, and the instruction conveyed to others is incidental.' He also informs us that 'a satisfied curator, like a finished museum, is damned and done for.' We know now the origin of the saying that 'he is well paid who is well satisfied.' Curators are never satisfied. In the same journal Mr. T. Sheppard has a paper on a Fisheries and Shipping Museum, which was read at the Stockport Conference of Museum curators on April 25th. Apparently this subject was accepted in place of 'Museums *versus* Refuse Destructors,' which was originally suggested.

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A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

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AND
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On Fissures, Faults, Contortions, Etc. Dr. Ricketts.
On Swiss Jurassic Foraminifera. Prof. T. R. Jones.

NOTES AND COMMENTS.

THE SPORTOPHYTE.

'Volume' III. of this 'British Journal of Botanical Humour,' the 'only comic scientific journal,' has made its appearance, and apparently the first piece of humour is giving the name 'volume' to a pamphlet of twenty-four pages. But we do not consider that the present 'volume' is as amusing as its predecessors. Dr. Stopes is evidently taking an interest in languages, and we find notes in French and German, though, as in the case of some of the contributions in English, the humour is very 'thin.' There are the usual botanical definitions, that of 'Siphonogames' being 'certain people who have very much need for soda-water in the morning.' There is a quaint poem on the 'Origin of the Angiosperms,' and a really charming 'Ecological Study of the Distribution of Vegetation in the Potteries.'

AN ECOLOGICAL STUDY.

In this we learn that the area investigated was King William Street, Tunstall. The street runs exactly north and south, sloping steeply towards the south. Consequently each side receives approximately the same amount of illumination, though, in both cases, the intensity is slight, owing to the prevalence of carbon in the air. The vegetation of the street is strictly limited to the window of the one front room, downstairs, of each house. This room, technically known as the 'best room' or 'parlour,' is seldom used, and seldomer ventilated, so that we can safely assume that we are dealing with a virgin forest flora. The most striking feature is the dominance of *Aspidistra lurida*.' Details are then given of the actual numbers, and percentages, of houses in the street; the number in which *Aspidistra* occurs, on the west side, and on the east side. A diagram showing the distribution of the species is promised when the paper appears 'in full.' And so on. The 'New Phytologist' may be obtained from the editor at the University College, London, for a shilling.

CLARE ISLAND

It is safe to say that no part of the British Islands has been studied more systematically than Clare Island. This excellent piece of work, organised by Mr. R. Lloyd Praeger, is very comprehensive, and includes not only the geology and physical features of the island, its history and archæology, agriculture and meteorology, but also every branch of natural history. Each section is being dealt with by a specialist, and Mr. Praeger is to be congratulated on his success in securing the active assistance of so many authorities who have made special visits to the island for the purposes of the survey. The results are being published by the Royal Irish Academy.

AND ITS BOTANICAL SURVEY.

About fifty of these will deal with the various groups of animals, and ten with the plants. Part X., dealing with the Phanerogamia and Pteridophyta, published recently, is by Mr. Praeger, and gives a most interesting and readable account of the higher plants under the following heads :—' General Features of the District,' ' Extent and Character of the Flora and Comparison of the Floras of adjacent Islands,' ' Description of the Vegetation,' ' List of the Flora,' ' Influence of Man upon the Flora,' ' Origin of the Flora,' ' Transport by Water, Wind and Birds.' The part is illustrated by nine of Mr. Welch's excellent photographs, and a vegetation map which shows with great clearness the chief plant associations of the island. The many-sided outlook on the flora of the island shown by Mr. Praeger in these 112 pages is worth careful consideration by all interested in study of the natural history of a restricted area.

' PUNCH,' THE NATURALIST.

We have previously had cause to grumble at the fact that our contemporary, *Punch*, pays too much attention to Natural History. The limit has surely been reached in the number before us (No. 3701). There is an illustration of a young man who has apparently succumbed to the ' effect of a too prolonged study of the cuckoo's note,' or at any rate made that his excuse ; there is an illustration showing the best way to decoy snails from a garden city ; the artist, oddly enough, being a ' Bird ' ; and there is an illustration of a teacher instructing a ' Nature Study ' class to ' make careful notes of the behaviour of the ordinary earthworm on its emerging into daylight!' Among the notes not illustrated are references to an ' eight legged fish that barks like a dog,' an ancient story about a telescope ' useful for Naturalists and *Etymologists*,' ' larks' eggs six thousand years old,' ' The Rose Garden,' a terrier that was run over but only slightly injured, and Sudden Sundays. There is a poem to a Crustacean, which begins ' Lobster, lo! ' ; there is a cartoon depicting cruelty to the race-horse, Tagalie. There are references to dams for fish ; a note on Sodium Phenylmethylpyrazolonamidomethansulphonate ; a Lover of Nature who shot elephants, deer and grouse ; Peacocks and Pansies, etc. The same number contains illustrations of a dog, lion, elephant, crocodile, cat, palm trees, fir trees, horses, dogs, rose trees, a cow, calf, and Mercury. If *Punch* will not leave the Naturalist alone, *The Naturalist* will have to seriously consider the advisability of being humorous.

THE NEW LONDON MUSEUM

We recently paid a shilling for a guide to the extraordinary miscellaneous collection gathered together, with no apparent

arrangement or classification, in the new 'London Museum at Kensington Palace.' The objects exhibited include an umbrella used by the Prince of Wales, shoes and socks worn by the late King, and similarly instructive relics; while a distinct Madame Tussaud flavour is given by the exhibition of a model of Jack Sheppard* in his cell, and other similar exhibits. Among the collection, of course, are many really valuable and appropriate exhibits. We bought the guide in order to get information about some of the specimens which were not labelled, but the objects were not even mentioned, nor could reference to the cases be found at all. On the title page we are told to 'NOTICE.—This catalogue and guide are copyright, and immediate proceedings in Chancery will be taken against any infringers thereof.' The punishment would certainly fit the crime!

AND ITS CATALOGUE.

The guide itself is a fair model of what such a guide should not be. It is badly printed, with ancient type, on poor paper. The details of the cases are mixed up with the history of the Palace, and with a catalogue of the pictures, and there is no index; so that it is really a difficult matter to find anything in it. Many of the cases are not numbered at all, and we read 'Case No. (long),' 'Case No. (side),' 'Case No. (centre)' 'Case No. (side long),' and so on. An idea of the scheme of 'classification' can be obtained from the following particulars of the first few cases, in which, if anywhere, an attempt at classification has been made:—'Case 1, Stone Ages, Bronze Age, late Celtic Period. Case 2, Ceramic Art. Case 3 [No heading at all! but apparently contains objects of the first to fifth century, A.D.], Case 3 (continued) Saxon Period, "Relapse to Barbarism" [sic]. Case 4, Early Mediæval Pottery. Case 5, Battle Axes, Swords, etc. Case 6, Wine Bottles. Case 7, Lighting Appliances. Case 8, Prehistoric Mammalia, etc. [the "etc." includes all sorts of things that ought to be miles away]. Next is a 'Green Coloured Bust' [sic] and a 'Bell in Case.' Then 'Case No. 9, Mediæval London,' and so on to case 12. Then follows a description of 'Queen's closet,' and 'Pictures of Old London,' followed by 'Nos. 20 to 34,' which are apparently pictures. After all this, oddly enough, we come to a heading in large type, 'London Museum Exhibits,' and calmly proceed to a list of the contents of case No. 13. And the guide ends up with 'A Condemned Cell, Old Roman Galley, Mantelpieces, etc., Panoramic Models of Old London, Lobby for Various Exhibits, Old Jacobean Room.' It was with some such remark as 'A Condemned Cell' that we closed the 'Guide,' and thought of what *might* have been done with that shilling.

* Even the name of this Great Hero is spelt wrongly in the catalogue!

THE PUBLIC UTILITY OF MUSEUMS.

Lord Sudely has kindly favoured us with a copy of a pamphlet he has issued on 'The Public Utility of Museums.' It contains a number of letters written by Lord Sudely and others to *The Times*, as well as leading articles in that journal, reprinted in convenient form. The pamphlet should be in the hands of everybody interested in the educational work of our museums. Briefly, Lord Sudeley's suggestion is, that the educational value of our great museums would be considerably increased if guides were appointed to conduct visitors round the collections, explaining the more interesting and more important exhibits. Since the letters appeared, the experiment has been tried at the British Museum, and from what we have personally seen at that institution it can certainly be looked upon as successful. A time table has been drawn up so that the visitor may arrange to hear the guide's remarks on any subject in which he is particularly interested. Arrangements can also be made for special parties to be conducted round the collections, without charge. There can be no question that Lord Sudeley's suggestion is on the right lines. Whether it can be carried out in the provincial museums or not will largely depend on the old question of funds. It is certain that, except in rare cases, the curator cannot spare the time for these lectures. And most visitors would be glad to have such guidance, and would profit thereby.

THE YORK MUSEUM

On June the 6th, Dr. Tempest Anderson, the President, formally presented a magnificent lecture theatre to the Yorkshire Philosophical Society, which will be a valuable addition to the Society's property. In the erection of the new room full advantage has been taken of all modern improvements. The former lecture theatre, which was too small for the Society's requirements, has been levelled, and makes a convenient entrance-hall to the museum. At present, however, the exhibition space available in the museum is still much too small, and has not been improved by the recent changes.

AND ITS NEW LECTURE THEATRE.

The lecture theatre was opened by Prof. Bonney, who gave an address on the advantages of nature study, and on the history of York; oddly enough the audience almost entirely consisted of York people. Mrs. Gray, in a charming speech, presented Dr. Anderson with an illuminated album from his numerous friends, which contained an expression of thanks for the Doctor's various acts of generosity. The Very Rev. the Dean of York, after a few well-chosen words, unveiled a portrait of Dr. Anderson, which is to adorn the walls of the new room. In this we must admit we missed the pleasant

and 'knowing' smile so familiar with us on the original of the portrait; and we can understand the statement that was made by a gentleman who had seen Dr. Anderson 'look like that when the hot water pipes had gone wrong!' Dr. Anderson returned thanks; Sir Everard im Thurm and Prof. Boyd Dawkins thanked Prof. Bonney for his address; and Prof. Bonney replied. Tea was provided in the Society's beautiful grounds, and the band of the York Company of the National Reserves played 'I don't care what becomes of me,' 'Yip-i-addy-i-aye,' etc.

ROMAN IRON FROM CORBRIDGE.

Sir Hugh Bell has kindly favoured us with a copy of an interesting paper which he recently read at a meeting of the Iron and Steel Institute. During the excavations on the site of the Roman station of Corstopitum, near Corbridge, the remains of a furnace were found, in which was a bloom of iron, weighing over three hundredweight. It was three feet four inches long, seven inches square at one end, tapering to four and a half inches at the other end, which was well rounded. In order to make a thorough investigation, the bloom was sawn through, and carefully examined, the results of which are given in the paper. It is apparent that the bloom was built up by small ingots of iron being welded together, and in the opinion of Sir Hugh Bell and others, the iron was probably derived from the local blackband ironstones of the Carboniferous series. The paper is accompanied by a map, photographs of the furnace and bloom, and of photo-micrographs of the metal.

AN EAST ANGLIAN ELEPHANT.

In a recent number of *Nature* Mr. J. R. Moir has an illustrated note describing an elephant's tusk found at the top of the Middle Glacial Sand, beneath the Chalky Boulder Clay, near Ipswich. As no human bones were found with the tusk, however, we can hardly agree that 'this discovery appears to be of some importance, and affords an answer to those critics who were dissatisfied with the discovery of the human skeleton because any other mammalian remains were not found at the same horizon.' The tusk recently found may have been at the same depth as the alleged pre-glacial human skeleton found some little time ago; but, as previously explained in this column, the mildest verdict that can be given with regard to the alleged great age of the Ipswich man is that the matter is 'not proven.'

THE IPSWICH SKELETON.

Since our remarks on the Ipswich skeleton were made, we have received the *Antiquary* for June, which contains a report of the paper read to the Royal Anthropological Institute in

reference to these human remains. From this we gather that Prof. Boyd Dawkins, who has a reputation both as a geologist and anthropologist, said that 'on the previous Saturday he had made a careful examination of the section in which the skeleton was found, and he was of opinion that the interment was not found beneath the boulder clay as such. The clay was not *in situ*, but there had been a vertical movement in that section. There was absolutely no geological evidence in that place of pre-glacial man. In the case of the Ipswich skeleton there was every reason to suppose it was a modern interment.'

ANKERITE IN COAL.

In No. 75 of the *Mineralogical Magazine*, Mr. T. Crook has a paper on the frequent occurrence of Ankerite in coal. Doubtless many of our readers will have noticed the white layers which occur frequently as in-fillings of joint cracks in coal. These are miniature mineral-veins. Though averaging less than a millemetre in thickness in ordinary specimens, these veins are in many cases very numerous, and their presence constitutes an important feature in the composition of the coal. As a rule the dominant mineral is ankerite, which may be normal in composition (*i.e.*, correspond to the formula $2\,CaCO_3.Fe(Mn)CO_3.\ MgCO_3$.) or may contain a small excess of calcium carbonate, apparently in the form of an isomorphous growth. Calcite also occurs, and is sometimes the dominant mineral. The other associated minerals are iron-pyrites, barytes, zinc-blende, and galena. Examples of coal containing ankerite are recorded from Yorkshire, Lancashire, Nottinghamshire, and other coalfields.

INSECT REMAINS IN COAL.

At a recent meeting of the Geological Society of London Mr. H. Bolton read a paper on some Insect Remains from the Midland and South-Eastern Coalfields. The writer described a series of three insect-wings obtained by Dr. L. Moysey, from the Shipley Clay-pit near Ilkeston (Derbyshire), and a blattoid wing, and three fragments from the borings of the Kent Coal Concessions Company, Ltd., in East Kent. The first series of insect-wings occurred in greyish-brown ironstone nodules, which lie in bands in a yellow clay about thirty or forty feet below the Top Hard Coal. They are not referable to any known families. Three new families are formed to contain them, one of which is nearly related to the Dictyoneuridæ with some suggestion of the family Heliolidæ. A second new family is allied to the Heliolidæ, and the third new family to the Homoiopteridæ, or, as the writer believes, near to the Lithomantidæ.

THE ORIGIN OF LIFE.

The Presidential Address of Prof. E. A. Minchin to the Quekett Club is printed in the Club's Journal, recently published, and deals with 'Speculations with regard to the simplest forms of life and their origin on the earth.' He deals fully with what he terms the Lankesterian theory and the Arrhenian theory of the origin of life. But concludes: 'Since it is impossible to put the matter to a crucial test, each of the two opposed views remains a pious belief merely. For my part I believe that the view which a man holds with regard to the nature of life depends on the inner constitution and fabric, so to speak, of his mind, and not on his reasoning process. A man is born a vitalist or a mechanist before ever he has thought about such matters, and to argue on the subject is futile. At a time when I was younger than I am now, I have myself debated and discussed such matters hotly, like old Khayyám:—

> Myself when young did eagerly frequent
> Doctor and Saint, and heard great Argument
> About it and about; but evermore
> Came out by the same Door as in I went.

It is my belief that all that is gained by such discussions is to enable a man to ascertain what is the type of mental bias with which he has come into being. The questions which lie at the base of the difference of opinion are at present not capable of being put to the test; and so far as one can see, they seem likely to remain for ever the most inscrutable of problems.'

The Rev. E. Jones has presented a collection of remains from the Elbolton Cave to the Keighley Museum.

We learn from the *Yorkshire Evening News* that 'Professor Boyd Dawkins told a York audience that man was in York in the Stone Age. He said nothing of the stone-jar age.' Comic papers please copy.

From the Board of Agriculture and Fisheries we have received a leaflet No. 261, which deals with 'The Scawby Agricultural Credit Society. An example of an Agricultural Credit Society.' Scawby is near Brigg, in Lincolnshire, and the society referred to is the oldest of its kind in the country.

Mr. C. G. Lloyd, of the Lloyd Library, Ohio, has issued an admirable pamphlet entitled *Synopsis of the Stipitate Polyporoids*, which contains some of the finest illustrations of fungi that we have ever seen. As a frontispiece is a portrait of the Rev. G. Bresadola, of whom Mr. Lloyd states that he 'has the best critical knowledge of foreign Polyporoids, and to whom I am indebted for many determinations and advice.'

We have previously remarked on the large field covered by budding librarians. In a set of questions issued by the Library Association, for the 'Professional Examination,' under the head of 'Library Routine,' we notice 'D.—i.—State the Act or Acts under which Museums may be established in this country, and the provisions which such Act or Acts make for their financial support.' And in order to pass their examination, we suppose all the assistants must reply 'The Public Libraries Act, of course'!

A PRE-GLACIAL LAKE-BED NEAR NORTHALLERTON.

EDWIN HAWKESWORTH.

On a recent visit to Brompton, near Northallerton, a friend drew my attention to a section exposed in making a pond in his grounds. The surface was composed of a varying thickness of Boulder Clay, containing numerous boulders of Carboniferous limestones, sandstones and grits ; chert, grey and other granite, and igneous rocks, including basalts, and one of Shap granite quite a cubic foot in size. Beneath this Boulder Clay was a bed of peat and peaty silt, in some places seven or eight feet thick. Several small trunks, or branches of oak were found in this. The peat rested upon about eighteen inches of white marl, but, as the water had reached the top of this, and what had been dug out had been dispersed, an examination of it was impossible. However, I was informed that it was full of shells, which, from the description given, would most likely be some species of *Limnæa*.

My friend had laid aside, as a curiosity, a small mass of quite green, compressed moss, which he had found between the peat and the marl. I sent this to Mr. Wm. Ingham, B.A., who identifies it as one of the Harpidioid Hypna—*Hypnum fluitans*, Linn., group *exannulatum* Renauld. var. *pinnatum* Boulay, forma *gracilescens* Renauld. He writes that the same moss now exists on shallow water splashes on Strensall and Skipwith Commons, but the Brompton specimen differs from the modern representative in being more pinnately branched, and in hundreds of leaves floating off the moment its stem touches water, due, no doubt, to its great age. The present plant on the above commons is more rigid, and the leaves so firmly fixed that they never come off when the stems are soaked in water. The cell structure of the leaves is exactly the same in both cases, as is the nerve. Mixed with this moss were a few stems of *Hypnum cuspidatum*, our commonest moss in wet places. Notwithstanding its age, this is as rigid as its modern representative, and does not lose its leaves when the stem touches water.

I secured a small quantity of shell-marl which was found as a lenticle in the peat, and sent it to Mr. A. Gilligan, B.Sc., F.G.S., who has examined it under the microscope, and reports that it contains large numbers of *Gyrogonites*, the oospores (or seeds), of the calcareous algæ *Chara*. The spiral arrangement of the whorls can be seen on a number of perfect specimens. Many of the internal cysts (or nuts, as they are sometimes called), are present, both free from the surrounding case of calcium carbonate, and some still inside it. These show sharp spiral ridges. *Planorbis* is present in quantity,

but no perfect specimens. (I kept a good one out, before sending the marl to Mr. Gilligan). Small pebbles of an opalescent quartz, beautifully rounded, also occur.

My thanks must be expressed to Messrs. Ingham and Gilligan, for so kindly examining and reporting upon the moss and marl, respectively.

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ENTOMOLOGY.

***Dytiscus circumcinctus* Ahr. in the East Riding.**—On August 3rd and 10th, 1911, I captured several Dytisci in a pond by the River Derwent at Bubwith, and at the time put them away in my collection as *marginalis* L. However on sending a smooth ♀ to Mr. G. B. Walsh, he discovered that it was *circumcinctus* Ahr. On working through the beetles I find that there are several *marginalis* L. and six *circumcinctus* Ahr. (4 ♂s and 2 smooth ♀s). I believe that the only other Yorkshire capture was about forty years ago, when Archdeacon Hey and the Rev. W. C. Hey took a single smooth ♀ at Askham Bog.—W. J. FORDHAM, Bubwith.

Coleoptera at Riccall and Skipwith.—The following is a list of beetles found on Riccall and Skipwith Commons on the occasion of the Y.N.U. visit on May 4th. Most of the species have been kindly verified by Mr. E. A. Newbery.

Cicindela campestris L. Larvæ in burrows.
Acupalpus dorsalis F. Sphagnum.
Bradycellus similis Dj. ,,
Harpalus fœlichi Stm. (= *tardus* Pz). On sandy road.
Calathus melanocephalus L. Sphagnum.
Pterostichus nigrita F. Sphagnum.
Anchomenus fuliginosus Pz. ,,
Dromius linearis Ol. ,,
Haliplus fulvus F. In pond.
,, *lineatocollis* Marsh. In pond.
Hydroporus umbrosus Gyll. In pond.
Hydroporus gyllenhali Sch. In pond.
Agabus femoralis Pk. ,,
,, *chalconotus* Pz. ,,
Ilybius fuliginosus F. ,,
Dytiscus marginalis L. (larva) In pond.
Hydrobius fuscipes L. ,,
Philhydrus melanocephalus Ol. In pond.
,, *minutus* F. ,,
**Laccobius minutus* L. ,,
Helophorus aquaticus L. ,,
Helophorus æneipennis Th. In pond
Oxypoda longiuscula Gr. Sphagnum.
Gymnusa brevicollis Pk. Sphagnum
Conosoma pubescens Gr. ,,
Tachyporus obtusus L. ,,
,, *chrysomelinus* L. ,,
,, *hypnorum* F. ,,
Lathrobium brunnipes F. ,,
,, *terminatum* Gr. ,,
**Cryptobium glaberrimum* Hbst. Sphagnum.
Olophrum piceum Gyll. ,,
Philorhinum sordidum Steph. ,,
Coccinella, 11 *punctata* L. On Fir.
Halyzia 18 *guttata* L. ,,
,, 22 *punctata* L. ,,
Coccidula rufa Hbst. Sphagnum.
Micrambe vini Pz. Gorse.
Dolopius marginatus L. Sweeping.
Prasocuris phellandrii L. Sweeping reeds.
Lochmaea suturalis Th. Heather. (Type and a black form).
Apion ulicis Först. Gorse.
Sitones lineatus L. Sweeping.
Ceuthorhynchus ericæ Gyll. Heather.

W. J. FORDHAM, Bubwith.

* = Apparently new county records.

PHÆANGELLA SMITHIANA BOUD. (= *PSEUDOPHACIDIUM SMITHIANUM* BOUD.) IN YORKSHIRE.

C. CROSSLAND,
Halifax.

In August, 1911, Mr. T. B. Roe, Scarborough, sent me specimens of a minute Discomycete on browned leaves of *Empetrum nigrum*, from Seamer Moor, near Scarborough. When in a dry condition the margin of the ascophore is so much incurved as to give it the appearance of a Pyrenomycete; when, however, it is moist, mature ascophores are seen and its true character is at once revealed. Being out of the ordinary run of Discomycetes, mature specimens were straightway described and figured from a careful microscopic examination. This was done before trying to determine the species by aid of books, or to ascertain if it had previously been described. On eventually referring to the Trans. Brit. Myc. Soc., Vol. III., Part II., p. 81, I met with the description of a 'New Species of Pseudophacidium"—*P. Smithianum*—by Em. Boudier, with figure on plate 4. This also was found on browned leaves of *Empetrum nigrum*, collected in Ayrshire by Mr. D. A. Boyd, and in Ross-shire by Miss A. Lorrain Smith, and forwarded to Dr. Boudier by Mr. Carleton Rea. This appeared to be the same thing as the Seamer Moor gathering, but the description of spores and paraphyses did not quite agree with mine. M. Boudier describes the spores as hyaline or slightly coloured, at first filled with small 'oil drops,' and non-septate; paraphyses unbranched above, divided at base only.

The *early stages* of the spores of the Yorkshire specimens answer this description exactly, but later, the contents become homogeneous and take on a pale yellow-green tint which gradually deepens to dark olive; finally the spores are distinctly one-septate; the colour deepens tardily and during the change the ascus disappears; the spores are not expelled from the apex as is usually the case. Paraphyses profusely branched above.

Samples of the Seamer Moor gatherings were submitted to Dr. Boudier and his attention drawn to the dark coloured, one-septate, mature spores. After receiving a second lot, and further study of the ascophores, Dr. Boudier accepted the suggestion that this was the same species as the one from Scotland, described and figured in the above 'Transactions.' Evidently the Scotch specimens were immature, as he had not observed dark coloured, one-septate spores. He added that these characters necessitated the species being placed in another genus, and would set the matter right.

The following is a translation of his communication to the

'Trans. Brit. Myc. Soc.', Vol. III., Part V., p. 324, 1911-12 :—'When in 1908 I published in the "Trans. Brit. Myc. Soc." my note on the little Discomycete discovered by Miss Lorrain Smith, which was sent to me by my good friend, Mr. Carleton Rea, I believed myself to have in hand specimens which had attained their complete development. I had not noted anything further until August this year (1911) when our colleague, Mr. Crossland, had the kindness to send me numerous specimens on two different occasions. The examination of these specimens enables me to state what had already been recognised by our experienced colleague himself that the spores of this species were not only continuous and uncoloured or slightly coloured, but that with age, not only acquire an intense colouration, even to an olive-black, but also present a median septum, becoming clearly distinct only at this period of full maturity.

'I must also further remark that the paraphyses which I had seen at first simple, or only divided near the base, often present ramifications in the upper portions, a fact also observed by Mr. Crossland.

'These observations have necessarily modified my opinion as to the genus in which this species should be placed; and, although some of the characters do not quite accord, I believe it ought to be included in the genus *Phaeangella* of Saccardo.

'This necessary correction is one more proof of the opinion I have often expressed how little certainty is afforded among the Discomycetes by the divisions of the spores. These organs often present divisions in their interior only on their extreme development which suffice to place them in quite different genera; so also of their tardy colouration.'

A full description of the new find will be given later.

In the Transactions of the North of England Institute of Mining and Mechanical Engineers, Vol. LXII., Part V., Mr. James Lomax suggests the term 'Micro-coalologist' or 'some such name' should be given to an investigator of the microscopic structure of coal. If this is adopted, we would suggest the term 'microcarboniferouslimestoneologist' for members of the band studying the structure of the Carboniferous Limestone; and 'micromoorlogologist' for those now busy studying moorlog from the North Sea. But we think it would only be fair to consult the gentlemen concerned before victimising them in the way suggested.

It is encouraging to find what a great interest is taken in 'Nature Study' nowadays, and how anxious even our leading newspapers are to print anything with a natural history flavour. The following observation, by a Durham clergyman, recently finds space in the columns of the *Yorkshire Post*:—'Perhaps it may interest some of your readers to know that I found a cuckoo's egg in a nest with four hedge-sparrow's eggs. The nest was of course in a hedge, but the hedge was on the side of a highroad in North Yorkshire. The egg was very dark, and spotted all over, rather like a lark's in appearance, though slightly larger; but it was considerably smaller than that of a thrush.' Unfortunately we are not informed what shape the egg was.

XANTHIA AURAGO IN THE WEST RIDING OF YORKSHIRE.

B. MORLEY,
Skelmanthorpe.

THE status of *Xanthia aurago* as a Yorkshire species is based on the capture of about two dozen specimens, all within the area of Doncaster, Rotherham, Sheffield, Barnsley and Skelmanthorpe (leaving out Stainton's record of its occurrence at York). According to Mr. Porritt's 'List of Yorkshire Lepidoptera,' the first West Riding specimen was taken at Sheffield in 1859. The species was also taken there in 1860, and again in 1887. In 1893 it was captured at Rotherham and Doncaster; was taken at Skelmanthorpe in 1900 and 1901, and at Barnsley in 1903. At Skelmanthorpe the species was not seen during the period from 1901 to 1911, when three specimens were secured in Deffer Wood. It is interesting to know that it has been taken in so many widely-separated districts in our county, but the rarity and uncertainty of its appearances rather limits the satisfaction of knowing that it is included in our county's fauna.

The re-appearance of the species in Deffer Wood after the lapse of ten years, suggested the continuity of a race, and that it must be established there, but if that were the case, some substitute food was used, for its ordinary food, beech or maple, are both very scarce in the wood. Sycamore on the other hand, being very plentiful, was thought to be the probable substitute.

One of the moths taken last autumn was a female, and, after being kept alive for sixteen days, laid a few eggs here and there on twigs of beech. About the middle of April this year the little larvæ began to emerge from the eggs, and they were put upon bursting buds of sycamore. When it was almost too late, however, it was found that a grave mistake had been made, as unblown buds only should have been used. The larvæ when young are confirmed miners, and the necessary substance they require to mine into not having been supplied, many of them died. But a few revived and revealed their habit. The buds are entered at the base, and at once their development is arrested. Securely sealed in the interior, the larvæ consume all the inside of the buds, and find enough food to half complete their growth before they retire from their burrows. The bracts of the buds are not eaten, but are left complete. The next operation of the larvæ is to spin the edges of two leaves together, and hide inside during the daytime, or descend from the tree and hide on the ground, leaving the hiding places at night to feed on the expanded foliage.

On May 11th a search was made for wild larvæ on sycamore, and about a score were found. An earlier date would have given better results, for many of the dead buds were found deserted when opened, but there was abundant evidence that the species was common. Searching the leaves for hiding larvæ produced the best results, but that method was made very unpleasant by the continual shower of the larvæ of the various winter geometers whose numbers were countless.

Sufficient proof was obtained, however, that the species is indigenous in the wood, and it is probable that searching for the larvæ will prove it to be so in many woods in the south of our county. 'Sugar' can scarcely be relied upon as a medium of capture, as it has little attraction for the genus *Xanthia* in these parts.

The **Horniman Museum,** Forest Hill, has recently issued a useful 'Handbook to Marine Aquaria' (Second edition), with two plates. It contains 52 pages and is sold at twopence.

The Forty-first Annual Report of the **Rochdale** Libraries, Art Gallery, and Museum Committee expresses the hope that the extensions to the museum and art gallery will shortly be accomplished. We regret to see that the branch museum at Falinge Park has been closed.

The Report of the Museums and Art Galleries of **Glasgow** contains details of many additions to the various departments. Among the objects are many models, including those of ships. The Board of Education has made a grant of £220 towards the purchase of specimens during the year.

The Twenty-sixth Report of the Libraries and Museum Committee of **Great Yarmouth** contains illustrations of local shipping items in the Museum there, and also of Yarmouth Glass and Pottery. It is pleasing to learn that the chief librarian has discharged his duties with zeal and courtesy during the year!

The Twenty-fifth general Report of the Free Library and Museum Committee of **Bootle** contains a 'list of donors and donations to the museum', and also of 'loans and lenders.' We are also glad to learn that at Bootle, also, 'painstaking, efficient, and loyal service' has been rendered by every member of the staff!

The Second Report of the **Doncaster** Municipal Art Gallery and Museum (formerly it was the Museum and Art Gallery) contains the list of additions made, and also particulars of the work accomplished in the various rooms. 'Three additional rooms have been opened during the year,' which is a good sign. According to the turnstile, the daily average attendance has been 196, while on Sundays the average has been 383.

The Bankfield Museum at **Halifax** has issued a valuable pamphlet (No. 12) on 'Local Pre-historic Implements,' by H. P. Kendall and H. L. Roth. (20 pp., 6d.). It is well illustrated, and contains particulars of the finds made in the Halifax district. There is certainly something wrong with fig. 18, said to have been found near Todmorden. It is surely either a forgery, or from America. And we are not quite sure that there is satisfactory evidence that the spindle-whorl (fig. 43) is 'most probably pre-historic.' Being found among 'tipped debris' means that it is probably later in date; such things were in use even until comparatively recent times. The authors' remarks on the probable use of the so-called 'pigmy-flint' implements (pp. 15-16) are interesting.

YORKSHIRE NATURALISTS AT BRIDLINGTON.

The 237th gathering of the Union was held at Bridlington at Whitsuntide, May 25th to 27th. It is regrettable that the excursions were so sparseley attended, and unofficially represented, especially considering the excellent local arrangements made by Messrs. J. W. Stather and Thomas Sheppard. The weather was ideal, and it was thought that at least on the Monday's excursion the Societies in the East and West Ridings would have been better represented. However, if the attendances at the excursions were meagre (twenty on Saturday and thirty on Monday), good work was done by many.

The headquarters were at the Station Hotel, Bridlington, where a room was set apart for the use of the members, in which the meetings on the evenings of Saturday and Monday were held.

On Saturday, the geologists, under the guidance of Messrs. Sheppard and Stather, investigated the coast sections between Bridlington and South Landing, and on Monday, under the guidance of the same gentlemen, journeyed to Flamborough by train, and examined the cliffs from Thornwick Bay onwards to the South Landing. The botanists on Saturday visited Boynton Woods, under the guidance of Mr. J. F. Robinson, who was ably assisted by Mr. Hannah, the Steward in charge of the Boynton Estate. On Monday, with the same leader, Mr. Robinson, they journeyed to Flamborough by train, and, after watching the egg-climbers at work on the cliffs at Buckton and Bempton, worked back to Bridlington by way of Danes' Dyke Ravine.

At the evening meeting on Saturday, the President occupied the chair. Mr. Thomas Sheppard, F.G.S., read a paper on 'The Evolution of Bridlington.' After giving an excellent resumé of the geological formations on which the town is built, and also of those in its immediate vicinity, he dealt briefly with the growth of the town from very early times to the present day. In addition, he read extracts from old books in his possession, dating back to the middle of the seventeenth century, relative to local government, the local industries, and the tokens issued by many of the tradesmen of those days.

Of great interest was the exhibition by Mr. Sheppard of his collection of geological and antiquarian views of Bridlington and district.

Mr. J. W. Stather, F.G.S., followed with a brief account of his investigations on 'Moorlog: an interesting chapter in the history of the North Sea.' 'Moorlog' is a compact peat, brought up in pieces twelve to eighteen inches thick, in the nets of trawlers when working along the northern escarpment of the Dogger Bank, from a depth of about twenty

fathoms. In this vegetable matter have been detected remains of the Arctic Birch, Arctic Willow, Hazel, and seeds of the Bog Bean. No wind-born fruits have been detected. An interesting discussion followed the close of the lectures, and after several questions had been answered by the readers of the papers, hearty thanks were accorded to them on the motion of Dr. T. W. Woodhead, F.L.S., seconded by Mr. Thomas Castle.

At the evening meeting on Monday, the President again occupied the chair. Twelve societies were represented, and three new members were elected. Excellent sectional reports were given on geology by Mr. Sheppard, on Flowering Plants by Mr. Robinson, on Plant Ecology by Dr. Woodhead, on Vertebrate Zoology by Mr. W. Hewitt, on Conchology by the President and Mr. Thomas Castle, and on Marine Biology by Rev. F. H. Woods, B.D.

Cordial thanks were accorded to the gentlemen who had granted permission to visit their estates, and to the leaders of the excursions.

The Secretaries were requested to communicate with the Town Clerk of Bridlington and the Commons and Footpaths Preservation Society, in reference to the closing of the footpath on the South Cliff, by Pitt's Parade.

Appended are the Sectional Reports :—

Botany.—Mr. J. Fraser Robinson writes :—Those who attended the Whitsuntide meetings were remarkably well favoured in respect of weather, almost perfect sunshine prevailing during the three days ; and this, following upon the many showers of the previous week, made the field of operations in first rate condition, for the botanists at least. Saturday was devoted to the investigation of the village and woods of Boynton, and the adjacent dale made by the Gypsey Race, a very considerable chalk-country beck which rises some eight or nine miles to the north-west at North Burton, and enters the Sea at Bridlington Quay. The Gypsey was first approached and crossed at about a mile and a half from Bridlington Station. On the sides of the Wold sloping down to the stream, and on the terraces forming the banks with which, even in normal conditions, it is quite flush, there was ample scope for investigation. Hawthorn, *Cratægus oxycantha*—of the variety *monogyna* only—was everywhere flowering at its best in the hedgerows, whilst buttercups and daisies were most conspicuous in meadows and pastures. After a walk along the highroad, the footpath leading by the side of the Gypsey towards Boynton was taken, and by its side *Geranium Phæum* (dusky geranium) was noted, and a new station in the East Riding for Sand Garlic, *Allium Scorodoprasum* was discovered. The last plant was much infested by an Æcidiomycetous parasite.

At Boynton Church the party was met by Mr. Hannah, the genial steward of Sir Walter Strickland's estate, who showed them over the ancient structure. Big yew trees grow in God's acre, and at its gate there is a tall bush of barberry, which, although free from micro-fungi, had upon it one of the larger sort, namely, *Hirneola auricula-judæ* (Jew's-ear fungus), a species generally found on the elder. The village church and hall of Boynton are embowered in and surrounded by trees, many fine, big old samples of elm, beech, spruce, etc., being seen. Exotic trees have been largely introduced, the monarch of all being a fine specimen of spruce, *Abies pectinata*, estimated to be about 112 feet in height, and it was certainly 13 feet in circumference at 4½ feet from the ground. *Araucaria imbricata* (monkey puzzle), *Wellingtonia gigantea*, walnut, varieties of the horse chestnut, mulberry, etc., had flourishing representatives in the woods and gardens.

In a corner nearest to the hall, of the first fishpond visited, a new station for another and interesting plant was discovered. This was the common bladderwort, *Utricularia vulgaris*, growing in the very clear water, probably of the springs which supply the pond. (The elevation above sea level here is about 75 or 80 feet). In the ponds and on the margin, much shaded by the somewhat dense arboreal vegetation, grew the white waterlily (*Castalia speciosa vel Nymphæa alba*), *Lysimachia vulgaris, Rumex Hydrolapathum, Hippuris vulgaris, Potamogeton natans*, etc. Among the trees the hornbeam and the alder, both in fruit, were noted. In the same woods the enchanters' nightshade (*Circæa lutetiana*) *Lysimachia nemorum, Campanula latifolia, Scrophularia nodosa* and *S. aquatica*, were all intermingled in the undergrowth, which included also the ferns *Aspidium filix-mas* (the male fern), *Athyrium filix fœmina* (the lady fern), the broad buckler (*Lastrea dilatata*), and the prickly shield fern (*Polystichum aculeatum*). In the chalk-gravelly glades of the higher portions of the woods there grew profusely species like *Spiræa Filipendula, Viola silvestris, Rumex acetosa*, etc., with much earthnut, *Conopodium denudatum*.

Leaving the woods, the botanists reached the old road known as Wold Gate, which led them over Font Bridge back to Bridlington. By the road side a field of rye had just shot its first ears. The hedgerows here were very big with dense growth of hawthorn, bullace, gorse and crab; and, for the first time in the district, was found a single tree of the wild pear, *Pyrus communis*. A chalk roadside plant, the large woolly-headed thistle (*Cnicus eriophorus*) grew plentifully.

Whit Monday was spent rambling over and inspecting the natural history capabilities of Flamborough Headland. At the station the visitors divided into two parties, one for

botanical and general purposes, the other for geological. The former took the road to the north, making for the villages of Bempton and Buckton, which were reached fairly early. At the latter place, just at the little mere (E.R. dialect ' marr '), 251 feet above sea level, the old sunken lane towards the cliff edge was entered upon, and after half a mile the little stream which fills the mere was found cutting through a bit of marshy ground, a list of the plants of which may not be without interest. They were :—*Caltha palustris, Ranunculus hederaceus, R. Flammula, Cardamine pratensis, Valeriana dioica* (apparently the dominating plant in flower), *Menyanthes trifoliata* (buck bean, very sparingly), *Veronica beccabunga, Pinguicula vulgaris* (flowering nicely), *Anagallis tenella, Orchis latifolia* (not *incarnata*), *Eriophorum angustifolium, Carex glauca* and *Equisetum limosum.*

Photo by] [*C. W. Mason.*

Buckton Marsh, Flamborough.

Ascending the dry, grassy slope towards the northern edge of Buckton and Bempton Cliffs, the vegetation proved to be quite of a different order. The dominant grass is an *Agrostis*, in which were copiously intermingled *Viola silvestris, Polygala oxyptera, Lotus corniculatus, Lathyrus montanus*, Bernh, *vel L. macrorrhizus*, Wim, and chiefly the variety *tenuifolius* Roth., *Poterium Sanguisorba, Galium verum*, much *Conopodium denudatum*, and moonwort, *Botrychium Lunaria.*

On the dry earthen dyke which, surmounted with barbed wire, separates the field just named from the extreme edge

of the cliff, a number of interesting things were also found. Chief of these were *Cerastium semidecandrum, C. glomeratum* and *C. arvense, Daucus gummifer,* the four plantains :—*Plantago lanceolata, P. media, P. maritima* and *P. coronopus,* with *Hieracium pilosella, Rumex acetosella,* and the little spring grass *Aira præcox.*

Cow-parsnip and red Campion seem to be the dominant plants quite close to the cliff edge, and on the steep slopes down the gullies between the cliff faces.

After skirting the cliff edge for some distance past the Bempton section, at Cat Nab the party turned due south, proceeding along the fosse or deep depression of the Danes' Dyke, until the Flamborough village and station road was reached.

The ravine was a wilderness of flowering plants, some of which, in the order in which they were noted on the spot, may be mentioned. On the western face of the great earth-work, Furze or Gorse, with a considerable quantity of Common Broom, so uncommon in the E. Riding generally, were both flowering. Another leguminous plant, restharrow, was plentiful, but as yet, only in the vegetative state. *Pimpinella saxifraga, Silaus flavescens,* both also in leaf only, *Viola riviniana, Spiræa Filipendula,* primroses still in flower, but only a few signs of cowslip, were all found ; while the great beds of red campion, containing the biggest and most luxuriant specimens we have yet seen, were the admiration of all. *Epilobium angustifolium* will make a fine show when the red campion flowering-time is past. The true hemlock (*Conium maculatum*) grew amongst the rank vegetation in many places. Aspen trees (*Populus tremula*) hung out their silky fruit-catkins, and in damp ground at the bottom of the depression, many evidences of *Ophioglossum vulgatum,* the adder's tongue fern, were seen.

An interesting little oval pond, with dimensions of 20 by 15 feet, occurs in the depression not far from the Flamborough and Bempton Road. It was bordered by many big old tussocks of the common rush (*Juncus effusus*) which sprang from a green belt of *Callitriche verna, Myosotis palustris* and *Ranunculus aquatilis* var. or sub. sp. *heterophyllus.* Within this, towards the centre of the pond, was open water, while the middle was covered by an oval patch of the brown-green plants of the pond weed *Potamogeton crispus,* and quite close to the patch there were a few plants of the ' flowering rush ' (*Butomus umbellatus*), not yet, of course, in flower.

One had expected to see more of the orchidaceous type of plants in the district visited, but, except for twayblade (*Listera ovata*), which was plentiful, only *Orchis Morio, O. ustulata* and *O. latifolia* were observed.

Geology.—Mr. Sheppard writes :—During the week-end

the geologists were practically able to make a complete examination of the coast line of the headland from Bempton to Bridlington. At Thornwick Bay, Selwicks Bay, and near the lighthouse, many interesting effects of marine and subaerial erosion were clearly shewn, and near Thornwick Bay Mr. Stather pointed out a small decapitated valley, now dry, the head of which had been carried away through the falling in of a cave, now a small bay. The well-known buried cliff at Sewerby was seen to advantage, and a little further east the 'sponge-bed,' with its wealth of fossils, delighted the younger students. South of Bridlington the finely-laminated clays were seen to advantage, recent falls in the cliff shewing many fine sections. The beds were carefully examined in the light of the recent works of Swedish geologists in similar series, but no definite data could be gathered in the Bridlington sections. The beach and cliffs yielded many interesting erratics to some members who were beginning to take an interest in the study of geology.

Conchology.—Mr. J. W. Taylor writes:—There are sixty-two species of Mollusca already known to live in this district, of which twenty-five are fresh-water shells; twenty-nine land shells, and eight slugs, with very many well-marked and distinct varieties, but these I should imagine, are very far from exhausting the possibilities of the area in this direction.

Of the twenty-nine species of land shells, perhaps the most interesting is *Azeca tridens*, which has only been found at Danes' Dyke on one occasion; the interest of the other species lies chiefly in the varietal forms assumed under the different conditions to which they are or have been exposed.

Particular mention may be made of the primrose-coloured form of *Helix aspersa*, known by the name of var. *exalbida*; the beautiful trellised form, known as var. *clathrata*; the five-banded form, var. *zonata*; and the one in which all definite markings are obliterated, known as var. *unicolor*.

Helix nemoralis also present some remarkable differences to the ordinary shells; the var. *fascialba* is especially noteworthy as exhibiting the evidences of a former scheme of coloration, recalling by its arrangement, the species of the genus *Campylæa*, which are now chiefly restricted to the mountains of South and South-Eastern Europe, and reminiscent of the generalized type formerly existent.

The albino form, var. *albolabiata*, which is found within a very restricted area on the Flamborough road, displays with the albino forms of *Helix aspersa* and *Helix rufescens*, the wonderful effects of food or other life conditions in modifying in the same direction, several distinct and only distantly related species, and is a subject worthy of serious investigation.

The seven-banded *Helix hortensis*, found by the Rev. E. P. Blackburn at Flamborough, is well worthy of note as a very unusual modification, the var. *roseolabiata* has also been found at Bridlington.

Of the fresh-water species, especial mention should be made of the immense specimens of *Limnæa stagnalis* and *Planorbis corneus* found in the Boynton fish-ponds. They are among the finest British specimens known.

The discovery of the var. *albocincta* of *H. rufescens* by Mr. Stather, is the only addition to the known conchological fauna of the district. *Limnæa glabra*, found by Mr. Castle at Boynton, is a strikingly decadent species, and is in some years abundant in grassy pools at Danes' Dyke, many specimens being conspicuously decollate.

Planorbis albus is very fine in ponds on the cliffs at Flamborough, where *Planorbis nautileus* and its var. *crista* are found in abundance.

Anodonta cygnea is the sole known representative of the *Unionidæ*, and is only as yet recorded from the Boynton fish-ponds.

Of the Slugs, the most interesting form is *Arion ater* var. *albolateralis*, which has been found near Bempton ; it has pure white sides, and is jet black on the back. It is a very beautiful and striking animal, and in its most characteristic form is restricted to a limited area in North Wales, where it is found quite abundantly.

Marine Biology.—The Rev. F. H. Woods, B.D., writes :— The condition of the tides made any examination of the shore itself impracticable, and only a few of the most common and familiar molluscs and the like, were found in a living state. But a microscopic examination of drift produced fairly satisfactory results. One of the most striking features was the rather large number of young very fresh specimens of *Modiolaria discors*, shewing that this rare shell is evidently a native of the neighbourhood. On the other hand, *Hydrobia ulvæ* and *Tornatina obtusa*, of which there were only one or two specimens, are estuary-loving species, where they occur by the thousand. It seems not unlikely that they, together with a very worn specimen of *Mya truncata*, have been washed down the coast from Teesmouth, a well-known habitat of the last species. Another probable instance of migration in a passive sense, is the very worn specimen of *Cardium norvegicum*, the smooth cockle, which appears to be a native of the deep sea in the Hornsea district. The following is a complete list of the species found :—

Craspedochilus cinereus (a single valve only).
† *Anomia ephippium.*
**Mytilus edulis.*
Volsella modiolus.
‡*Modiolaria discors.*
† ,, *discrepans* [=*nigra*].
Ostrea edulis.
† *Pecten opercularis.*
,, *tigerinus* (fragment).
Turtonia minuta.
Cyprina islandica.
Montacuta bidentata.
Tellimya ferruginosa (fragment).
Lasæa rubra.
Syndosmya prismatica (fragment).
,, *alba.*
Tellina tenuis.
† ,, *fabula.*
Macoma balthica.
Donax anatinus.
Mactra stultorum.
† *Spisula solida.*
Lutraria elliptica (fragment).
Venus gallina.
† *Cardium echinatum.*
,, *edule.*
Cardium norvegicum (a very worn specimen).
Mya truncata (fragment).
Ensis [=*Solen*] *siliqua.*
† *Saxicava rugosa.*
† ,, *arctica.*
Barnea candida.
Zirphæa crispata.
**Patella vulgata.*
Gibbula cineraria.
Lacuna divaricata.
**Littorina rudis.*
* ,, *littorea.*
Rissoa parva.
,, var. *interrupta.*
Onoba [=*Rissoa*] *striata.*
Cingula [=*Rissoa*] *semistriata.*
Paludestrina [=*Hydrobia*] *stagnalis* [=*ulvæ*].
Trivia [=*Cyprœa*] *europæa.*
Velutina lævigata.
Buccinum undatum.
**Purpura lapillus.*
Nassa incrassata.
† *Bela* [=*Pleurotoma*] *turricula.*
† ,, *rufa.*
† *Tornatina truncatula.*
* ,, *obtusa.*

An asterisk (*) before a species shews that the specimen was found alive ; a dagger (†) that it was found only in a very young state.

It will be noticed that by far the majority of species are bivalves, which is what we should naturally expect on a sandy beach. At Scarborough, the algæ-loving univalves predominate. The absence of such familiar species as *Acmæa virginea, Helcion, Eumargarita, Littorina obtusata, Skenea planorbis, Natica alderi,* and all species of *Odostomia* and allied genera were particularly noticeable.

Vertebrate Zoology.—Mr. Wm. Hewett writes :—Not many species of mammals were seen. There was an abundance of hares and rabbits, and also one weasel, and at the evening meeting on Saturday, Mr. Thomas Audas reported having seen a badger.

The majority of those present at Monday's excursion took the opportunity of observing the wondrous bird life along the cliffs from Buckton to Bempton, where the Guillemot, Razorbill, and Puffin were in countless numbers, along with the Cormorant, Herring Gull, and Kittiwake. The methods of working by the egg-climbers, of which there were four parties operating, also proved of great interest.

I saw a single Wheatear at Buckton, and another at North

Burton, and other birds observed were the Rock Dove, Stock-Dove, Moorhen, Common Coot, Jackdaw, Swift, Cuckoo, Cormorant, Linnet (in abundance), Kestrel and Sparrow Hawk.

LEPIDOPTERA.—Mr. Wm. Hewett writes :—The only species observed were *Pieris brassicæ, P. rapæ, Vanessa urticæ, V. atalanta, Polyommatus phlæas, Melanippe fluctuata,* and *Stenopteryx hybridalis.*—W. E. L. W.

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NEWS FROM THE MAGAZINES.

In *Knowledge* for June, Mr. R. S. Bagnall has an illustrated account of some primitive British insects, the Protura, which he first met with at Mitford, Northumberland.

As a supplement to its *Journal* the *Board of Agriculture* has issued a Report on the Isle of Wight Bee Disease. It is well illustrated, contains 143 pages, and is sold at a shilling.

We notice a ' natural history ' monthly, (which, as usual, begins ' about ourselves,') adds a little variety to its columns by printing some of its illustrations upside down.

In *The Scottish Naturalist* for June, Dr. J. A. Harvie-Brown has a paper on ' The Fulmar : its past and present distribution as a breeding species in the British Isles,' illustrated by a map.

In the *Journal of the Manchester Geographical Society* (Vol. XXVII., Part II.), Dr. A. Wilmore refers to ' Some Geographical Problems of the Mid-Pennines.'

We have received Part XI. of Major Barrett-Hamilton's *History of British Mammalia* (Gurney & Jackson, 2/6). It deals with rabbits and hares, and there are illustrations of Scottish, British, and Irish hares, spoors, and skulls and teeth.

Part VII. of Buckman's *Yorkshire Type Ammonites* has been published, and contains figures and descriptions of *Ammonites solitarius, A. trivialis, A. tenellus, A. flavus, A. limatus, A. andraei, A. crassulosus, A. fonticulus,* and *A. crosbeyi.*

In *British Birds* for June, Mr. P. R. Lowe figures and describes what he considers to be a ' new race ' of the ' Lesser Black-backed Gull of the British Isles,' under the name *Larus fuscus britannicus.* In the same journal Mr. Charlton describes the behaviour in captivity of a Tengmalm's Owl, caught in Northumberland.

In *The Entomologist's Monthly Magazine* for June, Dr. Bergroth describes a ' New British Tipulid,' under the name *Ephelia verralli.* Specimens are recorded from Warwickshire and Derbyshire. In the same journal Mr. F. W. Edwards describes a dipteron new to Britain, viz. : *Oligotrophus ventricolus,* presumably from Oldham, Lancs.

In the *Geological Magazine* for June, Mr. B. Smith has a paper on the Green Keuper Basement Beds in Nottingham and Lincolnshire, and Dr. Stopes figures the famous shell of *Pectunctulus glycimeris,* upon which a human face is carved, and which is alleged to have been there before the formation of the Red Crag. All we can say is that the ' face ' on the shell is very suspiciously ' beery.'

Parts IV. and V. of *The Living Plant,* by A. E. Knight and E. Step, published by Hutchinson & Co., at 7d. each part, maintain the good features of the earlier numbers. They deal with the ascending and descending sap of plants in a popular manner, and on every page there are excellent illustrations of insectivorous plants, parasites, saprophytes, luminous plants, and others. There is a coloured plate with each part.

PLANT ASSOCIATIONS OF FLAMBOROUGH HEAD.

T. W. WOODHEAD, Ph.D., F.L.S.

ADVANTAGE was taken of the visit of the Yorkshire Naturalists' Union to Bridlington (May 24th to 28th) to make a series of preliminary observations on the plant associations of the Flamborough headland.

The area generally is so highly cultivated that at first sight it appears to offer little of interest to the botanist ; but closer examination reveals a number of points which are worth recording.

The area examined was the triangular promontory having Bridlington to Speeton as its base and jutting out six miles to the east into the North Sea.

The southern edge varies from twenty-five feet at Bridlington to 150 feet at Flamborough Head. From this point its northern border rises to 440 feet at Speeton, and throughout the greater part of its extent consists of precipitous cliffs of chalk, picturesquely weathered at the apex into numerous pinnacles and caves and covered by glacial drift of variable thickness.

Boynton Woods, lying a little to the west of this area, were also visited. The geology of the area has been carefully studied by numerous workers ; the most detailed account being that by Lamplugh, ' On the Drifts of Flamborough Head ' (*Quart. Journ. Geol. Socy.*, 1891), and to this I am indebted for the following brief account of the surface deposits. The vegetation of the area is determined mainly by the covering of glacial drift, and only to a slight extent by the underlying chalk. As determined by Lamplugh the glacial deposits consist of three series, viz. : (1) a lower dark boulder clay ; (2) an intermediate series of more or less stratified material ; and (3) an upper brown or red boulder clay, often discontinuous over the crests of the hills and mounds.

A striking feature of these deposits is an L-shaped chain of Kame-like or Esker-like mounds and ridges which extend from beyond Speeton and pass eastward in line with the coast to Sanwick. Here the chain bends sharply to the south across the headland, passing through Flambro' village, and terminates at Beacon Hill to the east of the South Sea Landing. As Lamplugh points out this chain of mounds marks the terminal limit of the great ice-sheet, and the material of the mounds was laid down during the period when the ice remained nearly stationary. This was followed by a period of fluctuation resulting in the deposition of the intermediate beds. Finally a great advance of the glacier took place, and spread over and even beyond the area occupied by the previous flow. This was

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of shorter duration, and on the melting of the ice the upper Clay was deposited.

The material varies considerably from fine laminated clays to sand or gravel, and these determine some peculiar features in the vegetation of the Headland.

There is no natural woodland, but there are several plantations and parklands. The largest is Boynton Wood, which was planted about a century ago, and contains a large collection of interesting trees planted mainly for ornamental purposes. These include many species of Conifers, *e.g.*, *Picæa Abies*, *Pinus*, *Larix*, *Cedrus*, *Sequoia*, *Thuja*, *Taxus*, *Araucaria*, also *Quercus* and *Juglans*. The prevailing Oak is *Q. robur*; the sessile fruited Oak is absent. There are many fine Beech, Sycamore, Chestnut and Ash, and the latter is the most commonly planted tree in the hedgerows. The ground Flora is of the moist flowery type so common in the glaciated areas of the East Riding, and consists of Red Campion, *Herb Robert, Greater Stitchwort, Lesser Celandine, Wood Avens, Forget-me-not, Primrose, and Wood Violet, with an abundance of Stinging Nettle, Enchanter's Nightshade, Yellow Pimpernel, Earthnut, Giant Bellflower, Figwort, also Male Lady and Brittle-bladder Ferns.

Conspicuous introductions in the ground Flora were *Saxifraga umbrosa*, and *S. Geum*; and along one of the paths occurred *Geranium phæum*, also *Allium scorodoprasum* and *Viola odorata*. Under groups of small trees in the park, the ground flora, which consisted of meadow species, showed interesting change due to the effect of shade. The species were the same as those of the surrounding meadow, but the change in dominance presented a striking contrast, the shade-enduring species standing out conspicuously among the diminishing light demanders.

The fish-ponds in the wood were fringed by an interesting zonation of species. The narrow border, between the path and the water's edge, was marked by zones, of which the conspicuous species in each zone were (1) Daisy; (2) Red Campion; (3) Spiræa; and (4) Rushes, Horsetails, and Water Plantain. The outer zone consisted of a grassy border in which the flowers of the Daisy formed a conspicuous white line. Associated with this were Dandelion, Spear-thistle, Coltsfoot, and Hog-weed, wind dispersed along the path; also the Germander and Common Speedwells, Blue Bugle, Ground Ivy, Self-heal, Cinquefoil, Creeping Buttercup, Strawberry, and the Common Mouse-ear Chickweed.

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* The names employed are those of the Botanists Pocket Book, Ed. 13., by G. C. Druce.

The second zone was a showy belt of Red Campion, together with species common in the adjoining wood, viz.: Wood Avens, Herb Robert, Wood Sanicle, Cleavers, and the Common Dock.

The third zone approaching the water's edge was dominated by the Meadow Sweet, shewing the interesting variations in hairiness from the lower to the upper leaves described by Prof. Yapp. Along with it were the Cuckoo Flower (Lady's Smock), Forget-me-not, and Marsh Horsetail.

In the fourth zone along the water's edge, the bases of the plants standing in very wet soil or in the water, were the Hairy Willow Herb, Yellow Loosestrife, Water Mint, Common Rush, Water Plantain, Great Water Dock, and the Smooth Water Horsetail; the three latter extending far into the shallow water. The chief rooted aquatics were the spiked Water Milfoil and the broad-leaved Pondweed. The free-floating aquatic, the large Bladderwort, was abundant. In an adjoining pond was the white Water Lily and a great mass of Marestail.

The other plantations of the Headland occur chiefly along the Danes' Dyke and at Sewerby, some of them, *e.g.*, Cockerill Hill Plantation, containing a considerable variety of trees. The Danes' Dyke plantation, which may be given as a type, is a Beech-Elm-Ash wood, with a moist and flowery ground flora. The Beeches were small, and here and there were a few Sycamores and Scots Pines and Larches. The dominant grass is the tufted Hair Grass, and the large Fescue Grass and hairy Brome Grass are common, while an abundance of false Brome Grass, with yellow green foliage occurs under the Beeches. The Red Campion is the conspicuous flowering plant, and seedlings are abundant.

Other common species are:—Small Celandine, Dog Violet (*V. riviniana*), Wood Avens, Brambles, Herb Robert, Broad Smooth-leaved Willow Herb, Hemlock, Cleavers, Primrose, Forget-me-not, Marsh Thistle, and a few plants of the Woolly-leaved Thistle, Tway Blade, Spotted Orchis and others adding to the variety; but confined chiefly to the path sides were the Creeping Buttercup, Daisy, Broad-leaved Dock, and Vernal Grass.

In places where the steep entrenchment was planted with trees, the former covering of meadow species was replaced by a carpet chiefly of Red Campion and Male Fern; another striking instance of the influence of trees on the ground Flora.

Most of the land in the area is arable; Rye (in ear) being noted, which is one of the interesting cereals in the East Riding.

The pastures are of two main types, which in the spring are respectively dominated by the bulbous Buttercup and the Daisy. These two species, when very conspicuous, indicate

two quite well marked types of soil. The fields yellow with the Buttercup indicate heavy clayey soil and what is of great importance to the farmer, a good crop of grass. On the other hand the Daisy indicates a lighter, drier, and poorer soil, and a poorer grass crop. These two types of grassland are marked off in the main by the Kame-like ridge running from Speeton to Sanwick; the fields inland from the ridge being dominated mainly by the bulbous Buttercup, while in those between the ridge and the coast the Daisy is the conspicuous flowering plant. These are connected by an intermediate type in which neither plant gains preponderance.

Photo by] [*C. W. Mason.*

Buckton Marsh, Flamborough.

The Danes' Dyke provides an interesting illustration of change of species due to environment. On the summit of the high ridge are many dry-loving species. These give place on the slope to species requiring greater protection, and in the hollow is every gradation from meadow to marsh and aquatic plants, according to water supply. The Gorse was often abundant on the ridge together with tree-like specimens of Broom with stems 4 to 5 inches in thickness. Along the fringe of the coast everywhere capped with glacial drift and often covering a considerable part of the slope, the prevailing plants are those of the adjoining pastures.

The following list of species at Bempton Cliffs is fairly typical: — Sheeps Fescue Grass abundant; Cocksfoot and Smooth Meadow Grass common; the four Plantains, Ribwort,

Hoary, Sea and Buckshorn Plantains, Bulbous Buttercup, Small Celandine, Red Campion, Common and Mouse-ear Chickweeds ; Sea Thrift, and Bird's Foot Trefoil occur in large showy patches ; Yellow Bedstraw, Cleavers, Nettle, Hogweed, Primrose and numerous composites, *e.g.* :—Daisy, Dandelion, Yarrow, Burdock, Black Knapweed, Scentless Mayweed, Ragwort, Small Burdock, and Mouse-ear Hawkweed. On the chalk cliffs are large patches of the Common Scurvy Grass, and near Sewerby and frequently on the drift of the east coast the great Horsetail is a conspicuous species.

Frequently, however, maritime species predominate. The most interesting association, well developed along the edge of the cliffs between the North Sea Landing and the Lighthouse, is the Plantago sward. Here the dominant species over considerable areas is *Plantago maritima*, often with a considerable admixture of *P. Coronopus*. The plants, closely grazed and frequently trampled by visitors, are very small. The rosettes are rarely more than an inch in diameter, and the leaves are pressed flat to the ground ; the flowering spikes, too, are on very short stalks. The chief grasses are *Festuca ovina* and *Anthoxanthum*, and in places the Thrift is an abundant constituent.

Field ponds and small marshes are numerous on the Headland, an account of which will be given later. The most interesting marsh visited was near Buckton some 300 to 400 yards square, and for the following details I am indebted to Mr. J. Fraser Robinson.

The marsh is fed from a spring issuing from the chalk not far from the cliff edge, and drains eventually into Buckton Mere. The commonest species were Marsh Valerian, Glaucous Sedge, and Carnation Sedge. Other common species were Ivy-leaved Crowfoot, Lesser Spearwort, Marsh Marigold, Lady's Smock, Water Mint, Brook Lime, and less frequent in clayey marshes were Common Butterwort, Bogbean, Bog Pimpernel, Marsh Orchis, Marsh Arrow Grass, Narrow-leaved Cotton Grass, and Smooth Water Horsetail.

The *Barnsley Technical School Magazine*, No. 2, contains 60 pages, and is well edited. Among the articles is one by Mr. A. Whitaker, on 'The Development of the Senses in Bats,' reprinted from *The Naturalist*. There are other natural history notes.

Two parts of Cassell's *Nature Book* are before us. Mr. F. M. Duncan describes the 'shell-dwellers,' though we like his photographs better than his descriptions. There is a striking article on the 'History of a Mountain,' by the late J. Lomas, and some beautiful photographs of fungi, by Mr. H. Irving, which are described by Maud Clarke.

Parts XXI. and XXII. of Dr. Reinhard Brauns' *Mineral Kingdom* have been issued, and as this remarkable work is to be completed in twenty-five parts, the end is in sight. The parts are up to the usual standard, and the coloured illustrations of Fluor-spar from Cumberland, Northumberland, Durham and Derbyshire, on plate 71, are particularly fine.

In Memoriam.

THOMAS NEWBITT, F.G.S.

1846-1912.

We much regret to record the death of Mr. Thomas Newbitt, of Whitby, which occurred with tragic suddenness on Saturday, June 15th. Since he retired from his scholastic work in 1899, he has taken a prominent part in the municipal and scientific

Yours truly
Thos. Newbitt

life of the town he had made his home in later years, though his birthplace was in Lincolnshire. On the death of Martin Simpson, Mr. Newbitt was appointed Honorary Curator and Secretary of the Whitby Literary and Philosophical Society, the reports of which, as we have had the pleasure of noticing from time to time, have contained many evidences of his activity. Not only has he been entirely responsible for the arrangement and classification of the contents of the museum in recent years, but he has also catalogued the coleoptera and lepidoptera, the ethnographical specimens, and the fairly extensive library. He has also devoted much time to the geological collections, and has assisted Mr. Buckman in the preparation of his work on ' Yorkshire Type Ammonites.'

For thirty years Mr. Newbitt acted as Local Registrar for the Royal Meterological Society, and took the records from the instruments twice daily. In this, and in other directions he did a lot of conscientious and valuable work in a quiet way. We have had occasion to write to him on not a few occasions, and in every instance found him to be most willing to give what information was in his power.

In his early years he had a taste for scholastic work. He matriculated at the London University, was Mathematical Master at Wesley College, Sheffield, and in 1871 established a private school in Whitby, which he kept until he retired in 1899. He was a Fellow of the Geological Society since 1898.

We extend our sympathy to Mrs. Newbitt and the members of the family.—T. S.

——: o :——

A HUMBER SALT-MARSH.

T. STAINFORTH, B.A.

An interesting Salt-Marsh plant association exists at the present time on the Humber shore, south of Welwick and to the east of the Patrington Channel outfall. The area covered by vegetation is bounded by the Humber bank west of Welwick (Humber side) Lane and the Patrington Channel, and to the south by barren mud-flats. On a visit to this place about the middle of June my attention was drawn to some large masses of the foliage and numerous undeveloped panicles of the Sea Lavender (*Statice Limonium*), Closer search showed that a distinct belt of this plant, consisting of patches varying from a few inches to several yards in area, grew parallel to and at a few yards from the embankment.

In the Transactions of the Hull Scientific Club for 1901 (p. 234), Mr. T. Petch, writing on the occurrence of the Sea Lavender in Holderness, says 'there are two small tufts, one off Sunk Island and the other opposite Welwick'; and in the same paper states that 'the whole of the *Statice* on the Holderness coast could be held in one hand.' It is very gratifying to find that the plant has made such rapid progress during the subsequent twelve years, as now it would be possible to obtain a large quantity.

The area near Welwick upon which the Sea Lavender grows can only be reached by the Humber at extremely high tides, and consists of a marshy depression with a very gradual and almost imperceptible slope to the mud-flats. Indeed, the upper edge of the mud-flats, by which the marsh is bounded on the south, appears to be very slightly higher than the marsh itself.

1912 July 1.

Among the other plants occurring was the Shrubby Sea-Purslane (*Atriplex portulacoides*), which grew in shrubby masses dispersed over the whole of the area. The Sea-Pink or Thrift (*Armeria maritima*) formed an inner belt between the *Statice* zone and the embankment. Beneath the larger plants grew a close growth of 'Samphire' (*Salicornia herbacea*), which vied with the Sea Meadow Grass (*Glyceria maritima*) in distribution over the whole area. The grass, however, seemed to have the best of it on the edges of the mud-flats. *Salicornia* grew in especial profusion in a series of large rectangular shallow pits made for the purpose of repairing the banks, and each pit was bordered by a large mass of the *Atriplex*. The Sea Aster (*Aster Tripolium*) and Sea Arrow-grass (*Triglochin maritimum*) occurs over the whole ground, the *Aster* not of course being so conspicuous as it will be later in the year. *Artemisia maritima* occupied its usual belt on the dry embankment above the *Armeria* zone.

In the angle formed by the embankment I found scattered specimens of a species of a Scurvy Grass (*Cochlearia*), which Mr. J. F. Robinson identifies as *Cochlearia anglica*. Further towards the mud-flats, at the side of one of the gullies by which the ground is intersected, a small clump about four feet square, of the same plant in full flower, was met with. The record of this *Cochlearia* in the Flora of the East Riding is as follows:—'Brough, "introduced" (C.W.)', so that apparently the Welwick station where the plant occurs is its natural habitat, and where there is no reason to believe that it can have been 'introduced', is the first satisfactory record of the plant in East Yorkshire.

Changes in the conditions prevailing on the Humber shore, owing to natural and artificial causes, are so rapid and frequent that it behoves local naturalists to keep this interesting piece of Salt-Marsh under continual observation.

——: o :——

Pine Marten near Hebden Bridge.—On May 11th I went to Far Greave, Wadsworth, near Hebden Bridge, to see an animal 2½ feet long which Lord Savile's gamekeepers had caught in a 'figure four' trap, and which they thought was a 'mart.' Unfortunately it had been dead some days when discovered, and was quite unfit to bring away. Anxious to supply some evidence of the occurrence, I cut off the tail and despatched it to Mr. H. B. Booth, F.Z.S., of Ben Rhydding, and he kindly informed me that it was undoubtedly the tail of a Pine Marten (*Mustela martes*). My records shew that a Pine Marten was killed at Hebden Bridge on April 2nd, 1858, after many fruitless attempts had been made to trap it.—WALTER GREAVES.

FIELD NOTES.

BIRDS.

White Rooks at Brompton.—Two young Rooks were shot at Brompton on May 11th, 1912, which shew not the slightest trace of black ; indeed they are practically white—with a very

Photo by] [*C. D. Head.*

Young Albino Rooks in a Rookery near Brompton, Yorkshire.

slight colouring of cream or light cinnamon.—HARRY WITTY Scarborough.

—: o :—

MAMMALS.

Pine Marten in Cumberland.—A very fine male marten (*Martes sylvestris*) was trapped in a wood near Seathwaite in Borrowdale, Cumberland, in the spring of 1911. There are said to be two more about the same rocks this spring, but up to the present they have, I am glad to say, evaded capture. It is satisfactory to know that what is now one of the rarest of British mammals still manages to exist in the wilder parts of our isles ; but the sheep farmers do not love it, though, no doubt, the hill foxes are usually more of a danger to their weakly lambs.—E. T. BALDWIN.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

According to the report of the Borough Librarian and Secretary to the Museum Committee of the Borough of Beverley, just to hand, the Public Library Committee at **Beverley,** includes an assistant, an attendant, and Mr. and Mrs. Barrow, cleaners.

No. 4 of the first volume of the **Journal of the Torquay Natural History Society,** contains a continuation of Mr. H. J. Lowe's History of the Society ; abstracts of lectures on the Origin of Life, Economy in plants, Tides, Cyclones and Moorland Diatoms. Mr. E. V. Elwes has a useful paper on 'Local Natural History Societies,' and Mr. J. B. Bessell gives the second part of his list of the diatoms of the Torquay district.

The **Thirty-Fifth Annual Report and Proceedings of the Lancashire and Cheshire Entomological Society** (24 pp., 2/-), beside the list of members and summary of the proceedings, contain a valuable address on 'The Early Stages of our Dragonflies,' by Mr. W. J. Lucas. In this the author gives a useful summary of the literature on the subject, and points out the directions in which information is wanted in reference to the early stages of the Odonata.

Beside Prof. Minchin's Presidential Address, referred to in another column, the **Journal of the Quekett Microscopical Club,** No. 70, contains a paper by H. Sidebottom, on " Lagenæ of the South-West Pacific Ocean " (with 8 plates), another by C. F. Rousselet is on " *Notholca triarthroides*, *Cathypna brachydactyla*, and on a new Brachionus from North Dakota " ; and one by D. Bryce is on " Three New Species of Callidina " (illustrated). This last paper contains descriptions of *C. nana*, *C. concinna*, and *C. decora*. The first is apparently recorded from Epping and St. Leonard's Forests, and the last from Perthshire. With regard to *concinna*, however, though a detailed description of the new species is given, the question of locality is apparently considered to be of no importance, as all the information we can get as to its occurrence is 'habitat, in ground or wall mosses.' We have communicated with the author on this point, and he informs us that *concinna* has been found near London, Dunmow, Watford, and the Tyrol.

The **Lincolnshire Naturalists' Union Transactions for 1911,** containing pages 235-317, have just been published. There is a portrait and description of 'The Presidents (*sic*) of the L.N.U., the Rev. Alfred Thornley,' 'a little gentleman with a big sweeping net, who wanted to know what everybody was collecting, and to learn the scientific names of everything from plants to the smallest insects.' This was at an early meeting of the Union. There is also Dr. Wallace's Presidential Address, dealing largely with Beetles ; the fifth instalment of the list of Lincolnshire Coleoptera—a most carefully compiled account, by Messrs. Thornley and Wallace ; 'Additions and corrections to the Check List of Lincolnshire Plants, 1909,' presumably by the Rev. E. A. Woodruffe Peacock, though this is not stated ; and a well-illustrated account of the larger forms of Lincolnshire Crustacea, by Mr. A. Smith. Thirteen species are figured. There is a brief summary of the field excursions, and the reports of the sectional officers, viz. : Geology, Mr. H. Preston ; Botany, Rev. E. A. W. Peacock ; Conchology, Messrs. W. D. Roebuck and J. F. Musham ; Entomology, Mr. G. W. Mason ; and Vertebrates, Rev. F. L. Blathwayt. We notice that 'boulders,' 'cryptogams,' and 'fungi' (on the first page) are still considered to be 'sectional officers' of the Union. The addition of the words 'Recorders for,' or 'Secretary for,' would put the matter right, and should not be a difficult matter.

Naturalist,

NOTICE.

The **Annual Meeting** of the **Marine Biological Committee** will take place at **Robin Hood's Bay, October 11-15.** Professor Garstang of Leeds, and Professor Denny of Sheffield University, have kindly consented to allow the use of the Marine Laboratory, lately instituted there, as the centre for meetings and work. It is hoped that many members will avail themselves of the special opportunities of studying marine life in its various forms. All communications with respect to it should be addressed to Rev. F. H. Wood, Bainton Rectory, Driffield.

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A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY
T. SHEPPARD, F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;
AND
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Technical College, Huddersfield.

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

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EARLY MICROSCOPES.

T. SHEPPARD, F.G.S.

In connection with the system adopted at the Hull Museum, of illustrating the growth and evolution of the various exhibits, whether they are spinning-wheels, bicycles, lighting appliances or corsets, an opportunity has recently occurred of showing a series of instruments illustrating the evolution of the microscope.

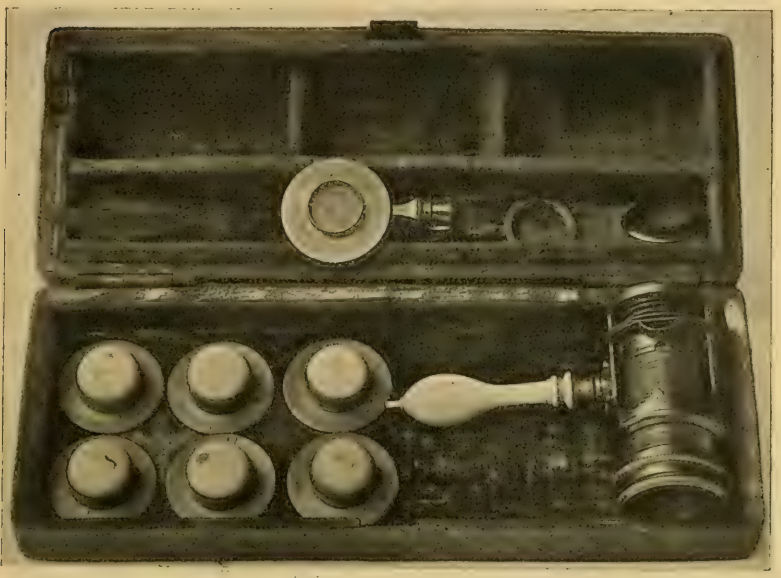

Fig. 1.
'Screw-barrel' Microscope, *circa* 1725.

The specimen shown in the first illustration is a pocket microscope, which dates to the early part of the eighteenth century, probably about 1725. A similar one is figured in George Adams' 'Micrographia illustrata,' 1746, plate V., figure 6. In that work the microscope is referred to as the 'screw barrell' or 'Mr. Wilson's single pocket microscope,' and it is there stated that this microscope of Mr. Wilson's is an invention of many years' standing. It will be seen that the microscope is focussed by means of a large threaded screw, which feeds into the butt of the instrument, and the objects are inserted through the stage, and held in position by means of a wire spring. The instrument is held in the hand by a turned

ivory handle. There are six lenses of various magnifying powers, protected by small ivory domes. There is also an arm, a forceps, and some small ivory slides, each of which holds four objects. There is a small box containing talc covers for the sides, and portions of elytra of beetles, etc., which were the favourite objects for examination. This very interesting series of specimens, complete in a shagreen case which measures $7\frac{1}{4}$ inches long by $2\frac{3}{4}$ inches wide, has been presented to the museum by Mr. T. Audas, L.D.S. It previously belonged to three generations of the Harrison family, one of whom, Robert, was a well-known microscopist early last century, and was the discoverer of the diatom, *Odontidium harrisonii*. This Robert Harrison was at one time curator of the museum of the Literary and Philosophical Society at Hull, which is now merged into the Municipal Museum, and in the building is a magnificent marble bust to his memory.

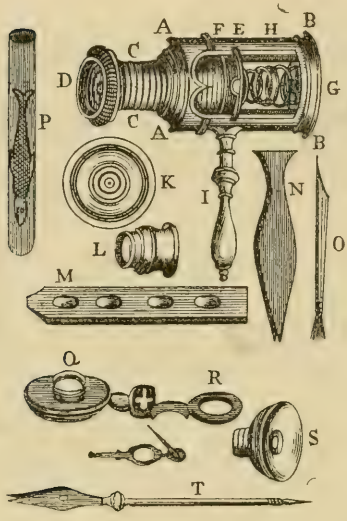

Fig. 2.

'Screw-barrell' Microscope, as figured in Adams' *Micrographia illustrata*, 1746.

The accompanying illustration (fig. 2) is taken from George Adams' 'Micrographia illustrata," 1746, and well illustrates the parts of this interesting instrument. The following description is as given by Adams:—

AB—The body.
CC.—Fine threaded male screw.
D.—Convex glass on which may be placed as occasion requires, concave pieces of thin brass with holes of different dimensions in their centres to cover the glass and diminish the aperture.
EF—Brass plate, one of which is bent to receive a glass tube (to confine living objects).
G—Hollow female screw to receive the magnifiers.
H—A spiral spring of steel to keep the objects in position.
I—A handle.
K—One of the seven different magnifying glasses.
L—The seventh magnifier, which can be used in the hand.

M—Ivory slip called a slider, with four round holes through it, wherein to place objects between two muscovy talcs.
N—Forceps.
O—A little brush.
P—A glass tube to confine living objects.

Fig. 3.
Microscope and Case, *circa* 1780.

QRST—An arm of which the hole *Q* screws into *G*, the speculum fitting *R*. The forceps *T* fit into a hole somewhere between *A* and *F*.

Hearing that we had such an early example, Mr. C. Davies Sherborn persuaded his brother, Mr. Sidney Newton Sherborn, to present the specimen illustrated in figs. 3 and 4 to our museum. It is a fine instrument, with a polished shagreen body. In Adams' work this interesting instrument is also figured (see fig. 5), and the following description is given to the

various parts of 'The double microscope, commonly, though very improperly, called the Reflecting Microscope.'

AB—Body of the microscope in which slides *CD*.
E—Eyeglass.
F—Broad middle plano-convex glass.
G—Object glass.
HK—Pedestal.
I—Tube carrying object glasses.

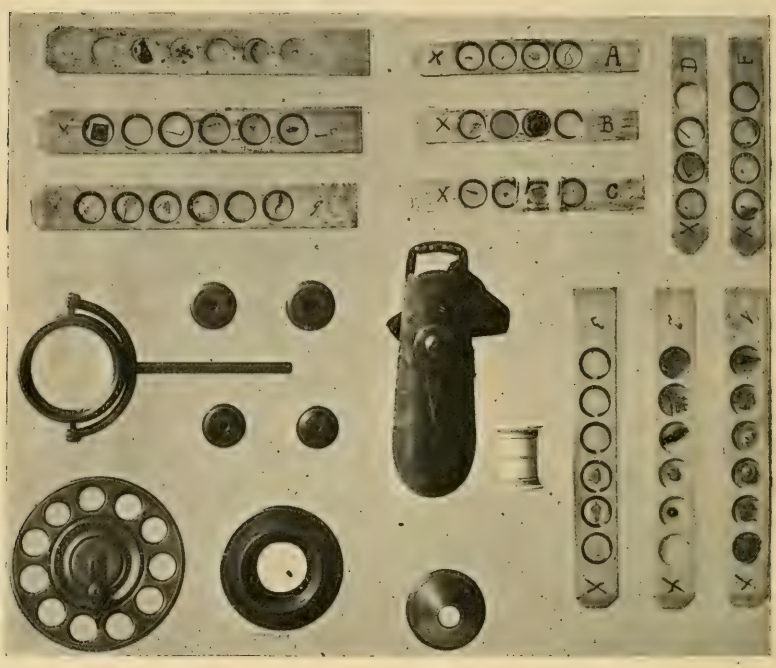

Fig. 4.
Accessories to Microscope shown in fig. 3.

J—Pair of nippers.
L—Drawer.
M—The stage.
N—Slider carrier.
O—Slider.
P—Fish-pan (to show circulation).
R—Concave looking-glass (mirror).
S—A plate, ivory one side, and ebony the other, for objects shown by light from the glass *a*, which turns on two screws *e* and *d*, and is fixed in a hole *f*.

T—A cone to screw into the centre of the stage to intercept some of the rays from *R*.
U—A brush.
V—A glass tube for living objects.
W—A cell containing a concave and a plain glass to confine fleas, lice, mites, etc.
X—A plain circular glass.

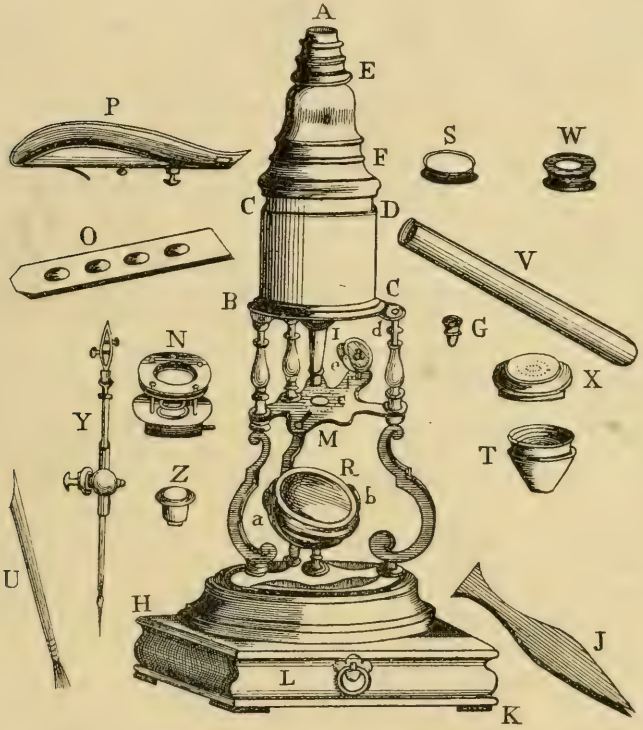

Fig. 5.
'The Double Microscope' (from *Micrographia illustrata*, 1746).

Y—A long steel wire forceps which fits into the slot on the stage.
Z—A white round ivory box to hold talcs for the sliders.

The instrument given by Mr. Sherborn is a slight modification of the above, and is intermediate between it and the one described as 'Culpepper's Microscope' by Kanmacher in his second edition of Geo. Adams' 'Essays on the Microscope,' 1798, pl. IV. This latter picture shows the ivory box *Z*

of our figure (*M* in Kanmacher), and the fish-plate *P* of our figure (*C* in Kanmacher), precisely as in Mr. Sherborn's gift, but the microscope itself has apparently two draw tubes and not one as in Mr. Sherborn's specimen. We can therefore safely date our new acquisition as about 1780. It is in a curious pyramidal oak case with a drop handle, and, as in the previous instance, is remarkably complete in the way of accessories. The microscope is on a mahogany stand, in which is a drawer containing four magnifying powers, in addition to that inserted in the instrument; a large number of bone slides of all sizes, some of which contain four and others six objects such as fish scales, pieces of feathers, corallines, portions of insects, etc., and a small ivory box contains talc covers for the object glasses. With the specimens is the following 'list of objects,' written in handwriting of a century ago:—No. 1, Butterfly wing, leg of beetle, seed, piece of diamond beetle, poppy seed, quills of hedgehog; No. 2, Ore, wing of insect, insect, shell, sea-weed, skin of sole; No. 3—Cutting of wood, ditto, ditto, scale of perch, scale of sole, scale of haddock. No. 4—Dust of butterfly wing, piece of ditto, farina, human hair, feather, eye of fly; No. 5—Wing of libella, cutting of hedgehog's quills, leg of gnat, wing of gnat, head of gnat, flea; No. 6—Sea-weed, ditto, bloom of grass, dust of poppy seed, hair off mouse, moss.

This microscope belonged to Charles Sherborn (1796-1858) to the late Charles William Sherborn (1831-1912), and more recently to Messrs. C. Davies Sherborn and Sidney Newton Sherborn.

As a connecting link between these early forms of microscope and the modern appliances, we have an instrument that belonged to the late George Norman, of Hull, the well-known microscopist and author of many papers on diatoms, etc. It was made by Cook over half a century ago, and, up to its time, was one of the best instruments available.

Two other forms, including the early binoculars by Messrs. Smith, Beck, and Beck, and others in the collection, well illustrate the growth and evolution of these complex instruments.

Should any of our readers possess early forms of microscopes likely to be of service in completing this series, we should be glad to hear from them on the matter.

Salmon in the Upper Nidd.—On April 20th, a Salmon smolt, in the silvery dress usually assumed by the young Salmon before their migration to the sea, was caught in the Nidd, just below Killinghall Bridge. This locality is very much higher than Salmon usually ascend the Nidd, and is worthy of record.—R. Fortune.

QUARTZITE BOULDERS IN THE SCUNTHORPE DISTRICT.

ARCHIBALD C. DALTON.

It has been previously shown* that we possess only a re-arranged glacial deposit in this district, and that quartzite pebbles were most abundant throughout the district. The prevailing character of the area is the large quantity of 'Blown Sand,' which is, in some places, over twelve feet in thickness.

Many of the quartzites command special attention, on account of their size, their shape and appearance.

While those previously recorded were just small pebbles and were found more often in clay, the specimens now under consideration are large, and found chiefly in the blown sand, they thus differ both in size and circumstances from those recorded by Mr, J. W. Stather† above the line of glaciation on the Chalk Wolds.

The rock, as judged from the boulders, varies in nature from a coarse grained one of a white colour to a fine grained variety more or less deeply coloured, as if by the presence of iron.

In the Scunthorpe Museum there are some remarkably fine specimens of the quartzite boulders, one of which is of exceptional size, and weighs 1 cwt. 2 qrs. 8 lbs.

The following are the measurements of the circumference of a few typical boulders, including the one just referred to.

'A' ..	52 inches ..	42½ inches
'B' ..	13½ ,, ..	13½ ,,
'C' ..	13½ ,, ..	14½ ,,
'D' ..	8½ ,, ..	7½ ,,

From the above it will be seen that the boulders resemble each other in shape. In appearance they are all polished by the action of wind-borne sand, while the boulder 'A,' which is flattened at one end, has the side, which faced the general direction of the wind, pitted by the sand being hurled against it, the other sides being just polished.

The origin of these boulders gives rise to much speculation; they certainly appear to be distinct from the smaller pebbles in my previous list, which were queried Trias by Dr. Dwerryhouse.

Perhaps after more evidence is at hand, we may be able to state something of the origin of these boulders; at present, opinion is in favour of their pre-glacial age.

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* A. C. Dalton, 'Glacial Evidences near Scunthorpe,' *Nat.* 1910, p. 377.

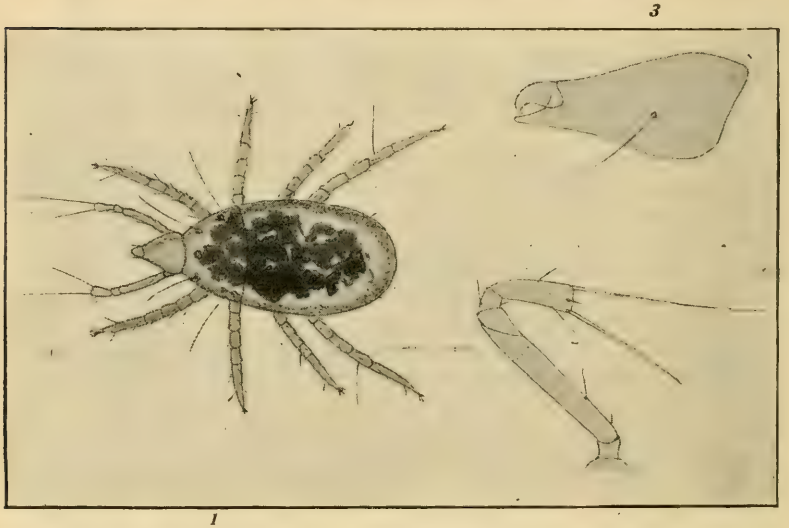
† J. W. Stather, 'Quartzite Pebbles on the Yorkshire Wolds,' *Nat.* 1904, p. 9.

1912 Aug. 1.

SOME BRITISH EARTHMITES.

C. F. GEORGE, M.R.C.S.,
Kirton-in-Lindsey.

Mr. C. L. Koch in his *Uebersicht des Arachnidea Systems*, published in 1837, divides his Schnabelmilben or Bdellides into five 'orders'. His first order, Bdella, contains fifteen species; his second order he names Ammonia, and includes five species. The mite I am now dealing with is not one of these five, but belongs to this order. The name Ammonia is objected to by N. Banks in his *Treatise on the Acarina* (1904), as being not



1.—***Cyta lutea*** n. sp. × 31. 2.—Palpus × 123. 3.—Mandible × 150.

only later, but pre-occupied, and uses instead the name *Cyta*. My mite I therefore call *Cyta lutea*. In size it is rather small, in figure it is oval. The proboscis is wider and shorter than that of any ordinary *Bdella*, and is joined to the body without any appreciable neck; by comparing the figure of this mite with Mr. Soar's drawing of *Bdella hexopthalma* (see *The Naturalist* for February last), the general difference of appearance between *Bdella* and *Cyta* is very obvious. In colour it is yellow, with brownish indefinite markings; but the most striking difference is in the eyes, which are black in colour, and five in number, two on each side of the cephalothorax, and a central one, near the base of the proboscis on the cephalothorax; a mounted specimen shows these eyes very clearly. In consequence

of their dark colour, and the pale yellow of the mite, they are also very evident in the recent specimen, and I have no doubt could be well seen in the living mite, which, however, I have not seen as my specimens were taken by Mr. Pickles, a schoolmaster, who transferred them (when caught), to preservative solution immediately. They were found near Kirton-in-Lindsey. The species is something like Koch's figure of *megacephala*, but he does not mention this central eye. The palpus is similar to that of other species of *Bdella*. This is the only species of *Cyta* (*Ammonia* of Koch), that I have as yet met with.

NESTING OF THE COMMON GULL ON THE FARNE ISLANDS.

H. B. BOOTH, F.Z.S., M.B.O.U.

REFERRING to my note on the nesting of *Larus canus* on the Farne Islands in 1910,* I have pleasure in reporting that this species has again nested there this year. I had heard of the occurrence before my visit to the islands in early July, and had hoped to have seen the young birds; but, unfortunately, the newly-hatched chicks were destroyed a week before my arrival, by Lesser Black-backed Gulls. This year the nest was on the 'The Farne' island itself, where the watcher, Robert Darling, lives during his residence on the islands. Darling (who knows the bird well) had the nest of three eggs under observation for some time. Shortly after the young had been hatched, he heard a commotion going on in the direction of the nest, and the plaintive cries of the parent birds. Hurrying to the spot, he found they were being mobbed by several Lesser Black-backed Gulls, and that the young Common Gulls had disappeared. He presumed the Lesser Black-backs had eaten the chicks, in the same manner in which they take the young Terns. On my return home, I communicated with Mr. H. A. Paynter (the Honorary Secretary of the Farne Islands Association), who had also seen the birds at the nest, and from whom I received the following additional corroboration :—'It was a pity about the Common Gulls. There is not the slightest doubt about it, as I saw the bird, its eggs, and also saw it sitting on its young ones—I was very disappointed, and so was Darling—at their untimely fate.'

* *The Naturalist*, 1911, p. 179.

SECOND SUPPLEMENT TO THE FLORA OF DEWSBURY AND DISTRICT.

By the Late P. FOX LEE,

With the object of bringing up-to-date this district's records of the flowering plants, ferns and charas, the following Second Supplement to the Flora of Dewsbury and Neighbourhood is given :—

The Flora was published in the 'Botanical Transactions' of the Yorkshire Naturalists' Union, Vol. I., 1877-1888, pp. 225-248, and the First Supplement at pp. 251-264.

As intimated when the Flora first appeared, it must be understood that the soil of the district, consisting of Coal Measure Clays and Shales, is geologically not an ideal one for very many of the rarer native British plants. Several of the streams, too, and their marshy margins are not so inviting to plant life as doubtless they would be in former times, yet the total number of wildings now known is nearly eight hundred.

The plant names entered in this Supplement with the numbers preceding them are those of the Oxford List of British Plants, 1908, by Mr. G. Claridge Druce ; a division has been made of the indigenous species and the aliens ; a few new localities for the rarer plants of the district have been given, with several corrections of the names and other details in previous lists.

The aliens recorded by Messrs. F. Buckley and A. Jessop, have been verified by Mr. S. T. Dunn, B.A., F.L.S., of Kew.

I desire again to offer my grateful thanks to Mr. J. G. Baker, F.R.S., of Kew, Mr. Arthur Bennett, F.L.S., of Croydon, and Mr. F. Arnold Lees, M.R.C.S., of Leeds, for much kindly help in the determination of critical species.

The additional localities are as follows, namely :—*Berberis vulgaris*, shrubbery, Lower Hopton ; *Carpinus Betulus*, *Taxus baccata* and *Ruscus aculeatus* also flourish in the district as planted specimens only .

Barbarea verna Asch. (*praecox* Br.). Sandy wayside near Overton.

Stellaria neglecta Weihe. Shady bank of Coxley Dam.

Malva moschata L. Abundant in a rough, undrained pasture, Haigh House near Thornhill Edge.

Impatiens parviflora D.C. River Calder banks, Mirfield, Ravensthorpe to Dewsbury. Quite naturalised.

Viola odorata. Hedge-bank, Carlinghow (J. A. E. Stuart & P. Fox Lee).

Ulex Gallii Planch. The autumn flowering species of Furze. Abundant on the steep declivity of Thornhill Edge.

Genista tinctoria, a relic of the older flora of the district, Heybeck.

ANTHYLLIS VULNERARIA. Railway embankment. 'Adventive here': (Lees).

MELILOTUS ALBA. By old lime kilns, Thornhill Lees.

ONONIS REPENS L. (*arvensis* L.). Meadow bank, Midgley; Railway embankment, near Mirfield (J. W. H. Johnson).

CORONILLA VARIA L. Alien Vetch. Corn mill, goit bank, Shipley Bridge, Mirfield. 'Native of woods and dry limestone hills, from Central and Southern Europe to Persia, reaching to Normandy, Belgium and Northern Germany, and in one locality even to England. There seems no reason to doubt that the station recorded by Mr. Plumtree (*Journal of Botany*, 1897, p. 449,) in a rough wood on the chalk in Kent, is a natural one. It is much more frequently recorded in England as a waste ground plant, in which state it is frequent over most of its range.' (Dunn's 'Alien Flora,' p. 54).

AGRIMONIA EUPATORIUM. Meadow, Thornhill Edge.

SEDUM ACRE. Abundant on Thornhill Edge.

SANICULA EUROPAEA. Whitley. (J. W. H. Johnson).

SAMBUCUS EBULUS. Calder bank, Mirfield; Ravensthorpe; Horbury. With us a Denizen. "A decoction of the root with an iron mordant has long been used for dyeing a raw blue, such as one sees bordering blankets, and I believe it was first brought to the Spen Valley nigh a century ago for that purpose.'—F. A. Lees.

CENTAUREA SCABIOSA. Hungerhills, Dewsbury (H. Parkinson).

CAMPANULA LATIFOLIA, with white flowers. Bank Wood, Emley Woodhouse; Hungerhills.

PRIMULA VULGARIS Huds. (*acaulis* L.). Sandy banks, Emley Woodhouse; Valley below Thornhill Edge.

P. VERIS (*officinalis* (Jacq.), Meadow, Whitley Lower. (H. Parkinson).

LYSIMACHIA NUMMULARIA. Abundant, and in fine bloom in a ditch at Horbury Bridge.

ANCHUSA SEMPERVIRENS. Hedge bank, near Overton. An outcast originally, no doubt.

MYOSOTIS VERSICOLOR. Upland Meadow, Whitley Lower. 'A true native of dry heaths and pastures in England, though so often recorded in local Floras only from artificial habitats.' (Dunn's 'Alien Flora,' p. 137).

ECHIUM VULGARE. Ravensthorpe (H. Parkinson). Casual only here and other places named in this Flora.

PLANTAGO MEDIA. Upland meadow, Whitley Lower.

MERCURIALIS ANNUA L. Waste ground, Mirfield.

SALIX CINEREA. The moat, Oakwell Hall, Birstall.

LISTERA OVATA. Shrubbery, Halifax Road, Dewsbury. Associated with lilac, white-beam, and lime trees, etc., and probably brought with them from some nursery. In 1892

two produced fine racemes of typical yellow-green flowers, and again in 1893, but no plants have appeared there since ; meadow bank near Overton (J. W. H. Johnson and P. Fox Lee) ; Meadow, Mirfield and Dimpledale (H. Parkinson).

TYPHA LATIFOLIA. Pond quite filled with this stately plant, near Thornhill Edge.

CAREX MURICATA. Canal bank and Hostingley Lane, Thornhill ; St. Mark's Church grounds, Dewsbury. Brought with grass seed most probably. (F. A. Lees).

C. CARYOPHYLLEA Latour. (*præcox* Jacq.). Coxley Valley ; Thornhill Edge.

C. PALLESCENS. Hungerhills, near Dewsbury.

DRYOPTERIS SPINULOSA. Wood near Haigh House, Thornhill Edge ; Emroyd, Smithy Brook, near Middlestown.

CORRECTIONS, ADDITIONAL INFORMATION, etc.

RUBUS PODOPHYLLOS P. J. Muell. When the record of this new species appeared in the First Supplement to this Flora, it had not then been assigned a plant list number. It is now No. 832 in the Oxford List, and its census number in 1908 has been extended to 19 of the 112 county botanical divisions of England, Wales and Scotland, with 2 in Ireland. ' It is a setose evolution from carpinifolius of modern-day development, to my eyes. It has been sent me from Halifax, and is on the "make" about Leeds.' (F. A. Lees).

ANAGALLIS ARVENSIS L. *flore.* Some time after mentioning this species in the First Supplement, p. 259, I saw several plants of a blue-flowered form of pimpernel, on waste ground, Steanard Lane, Mirfield (H. Parkinson) . . . ' with regard to the variety *cærulea,* the plant recorded under this name by British botanists is the blue-flowered form of the Pimpernel, differing from the type in no other respect than colour. It is a common cornfield weed in Europe, and frequently reaches this country as a grain introduction.' (Dunn's ' Alien Flora,' pp. 129-30).

' Yes, often seed-brought when blue or purplish, but also often blue on alkaline calc-soils, on sand a pale scarlet. The *blue* non-British species is a stouter plant with turgid capsules, *A. femina* Miller.' (F. A. Lees.)

SPARGANIUM RAMOSUM, var. *microcarpum* Neuman. In addition to my former note in the ' First Supplement,' (pp. 261-2), on this small-seeded variety of the Branched Bur-reed, I may say, it was fully described in the Hartmans' ' Handbok i Skandinaviens Flora,' 12th ed. (pub. 1889), as occurring in Gotland and Medelpad, two provinces of Sweden. About the time that Mr. A. Bennett reviewed this Flora of Scandinavia in the Journal of Botany for December, 1889, he informed me that my Dewsbury record was the only English one then known.

S. microcarpum was first found in the south of Scotland, and is now reported from several stations in England and Ireland.

The additions to the indigenous Flora with several Colonists, Denizens and Aliens hitherto included in the London Catalogue of British Plants, and other lists, are as follows :—

125. RADICULA (NASTURTIUM) AMPHIBIA (L.) Druce. Amphibious Yellow-cress. Canal and River Colne, Mirfield. See 'The Flora of the West Riding,' Miall and Carrington, p. 5.

206. BRASSICA NAPUS L. Calder Bank, Dewsbury.

249. THLASPI ARVENSE L. Calder Bank, Dewsbury.

254. TEESDALIA NUDICAULIS Br. 'Near Mirfield,' *vide* 'The Flora of West Yorkshire,' by F. Arnold Lees, p. 147.

294b. VIOLA RIVINIANA var. NEMOROSA (Neum.W. and M.). Moist meadow bank, Heybeck. (F. W. Whitaker & P. F. Lee).

377. STELLARIA AQUATICA Scop. Water Stitchwort. Addingford, Calder bank, Horbury. (W. Rushforth). New record for Calder basin.

481. GERANIUM PYRENAICUM Burn. fil. A rare denizen, roadside, Mirfield.

628b. TRIFOLIUM REPENS var. RUBESCENS Ser. (*Townsendii* Bab.). Waste ground, Dewsbury. 'But Adventive and Alien here—brought with grass seed or hen corn most likely.'—F. A. Lees.

669. ORNITHOPUS PERPUSILLUS L. Bird's Foot. Sandy roadside, Bretton. (H. Parkinson).

673. ONOBRYCHIS VICIÆFOLIA Scop. Railway embankment, Horbury Bridge. An escape from cultivation. 'Adventive here.' (F. A. Lees).

688c. VICIA SEPIUM var. ANGUSTIFOLIA Koch. Rough bushy pasture, near Overton.

872f. RUBUS DUMETORUM var. TUBERCULATUS (Bab.). Thornhill Lees.

876. R. CÆSIUS Linn. Dewberry. One of the five or six almost indistinguishable forms of this species; railway embankment and roadside. Thornhill Lees. 'Ballast brought, I believe.' (F. A. Lees). 'Unless we guess at brambles being bird-sown, *Vias Turdides*—thrushes eat the fruit, and are partially migrant.'

902. POTENTILLA PROCUMBENS Sibth. West Mills, Mirfield. (Messrs. Buckley and Jessop). An Adventive here, that is a native, coming by accident to a non-native station.

926a. ROSA CANINA var. LUTETIANA (Leman). Thornhill Edge.

943b. R. VILLOSA var. CÆRULEA. Woods. Apple rose, red rose. On shale heap, Thornhill Edge. (J. W. H. Johnson and P. Fox Lee).

982. SAXIFRAGA GRANULATA L. Meadow, Heybeck.

1003. RIBES RUBRUM L. Red Currant. Calder bank. Garden escape.

1003b. R. RUBRUM var. PETRÆUM Sm. Rock Currant. Stony hollow in Cliff Wood, Howdenclough (J. Walker). The rare Scar-limestone wilding occurs about Gordale and Malham. Here only 'Adventive' probably bird-brought.

1169. CAUCALIS NODOSA Scop. Ardsley (G. Roberts). See 'The Flora of West Yorkshire,' p. 262; Corn screening ground, Mirfield.

1173. CORNUS SANGUINEA L. Dog-wood. Hedgerow, near Overton. H. Hey. 'Adventive here.' F. A. Lees.

1217. VALERIANA DIOICA L. Small Marsh Valerian. Marshy ground, near Dyehouse Mill, Horbury (W. Rushforth).

1229. DIPSACUS FULLONUM L. (*D. sylvestris* Huds.). Fullers' Teasel. Railway Embankment, Thornhill Lees.

1229b. D. FULLONUM var. SATIVUS L. (*D. fullonum* Auct.). Railway embankment, Horbury Bridge.

1240b. EUPATORIUM CANNABINUM var. INDIVISUM DC. Hemp Agrimony, Coxley Dam (O. W Richardson)

1362. MATRICARIA SUAVEOLENS Buch. (*M. discoidea* DC.). Waste ground, Fieldhead, Birstall. 'A species without ray florets. In this country it is an introduction of very recent origin, but one spreading rapidly where the fields are manured with wool-scouring waste.' (F. A. Lees).

1367. ARTEMISIA ABSINTHIUM L. Wormwood. Abundant on woollen mill wasteground, Lower Hopton. (F. A. Lees).

1399. SENECIO VISCOSUS L. Stinking Groundsel. A casual, waste ground, and hedge bank, Savile Town.

1433b. CIRSIUM ARVENSE var. MITE Koch. Canal bank, Mirfield.

1433d. C. ARVENSE var. SETOSUM C. A. Mey. Margin of Lady Wood, Hungerhills, Dewsbury.

1599b. HIERACIUM VULGATUM var. SUBRAVUSCULUM W.R.L. Shady bank of beck, Whitkirk. (F. A. Lees and P. F. Lee).

1644. LEONTODON NUDICAULIS Banks. (*C. hirtus* L.). Hairy Hawk-bit. Coxley Valley.

1645b. TARAXACUM VULGARE var. ERYTHROSPERMUM (Andrz.). Sandy bank, Emley Woodhouse. Rare. New record for Calder basin.

1744. ANAGALLIS TENELLA Murray. Bog Pimpernel. 'Between Ossett and Wakefield'—never confirmed. See 'The Flora of West Yorkshire,' p. 379.

1856. HYOSCYAMUS NIGER L. Henbane. Waste ground, Paradise farm and Shepley Bridge, near Dewsbury.

2064. GALEOPSIS LADANUM L. Railway embankment, Mirfield (H. Parkinson). Generally a plant of dry gravelly or calcareous cornfields. A Colonist, according to Watson. 'Adventive here,' (F. A. Lees).

2090. PLANTAGO CORONOPUS L. Buckshorn Plantain. Fox Royd Lane, Edge Top, Thornhill, at about 550 feet above sea level. A considerable increase on its altitudinal range (0-300 feet), as given in 'The Flora of West Yorkshire,' p. 382. 'A plant of sandy places, and commonest near the sea.' (E. T. Gosling).

2121. CHENOPODIUM URBICUM L. Waste ground, malting mill, Mirfield.

2144c. ATRIPLEX PATULA var. ANGUSTIFOLIA (Sm.). Waste places.

2271. SALIX PURPUREA L. Red Withy (the form *S. Helix*). Osier-bed, Thornhill Lees, and see 'The Flora of West Yorkshire,' p. 405.

2274. S. VIMINALIS × CAPREA (*Smithiana* Willd.). Calder bank, Ravensthorpe (H. Parkinson).

2324. ORCHIS MORIO L. Green-winged Orchis. Liley Clough, Whitley Lower (Rev. Canon Fowler). Also with pure white flowers (H. Parkinson).

2343. HABENARIA BIFOLIA Br. Butterfly Orchis. Rare. Meadow on Calder bank, Lupset Pond, near Horbury (Miss F. Rushforth).

2363. GLADIOLUS COMMUNIS L. As an alien, railway embankment, Mirfield (H. S. Mallinson).

2471. LEMNA POLYRHIZA L. Greater Duckweed. Pond, Alverthorpe (T. W. Gissing). See 'The Flora of West Yorkshire,' p. 413.

2483. TRIGLOCHIN PALUSTRE L. Arrow-grass. Boggy ground, Horbury (W. Rushforth)—addition for Calder basin. Cockersdale, Drighlington, addition for Aire basin.

2511. POTAMOGETON INTERRUPTUS Kit. (*flabellatus* Bab.). In luxuriant barren masses of a brilliant green colour under the swiftly-running waters, and growing on the paving stones of canal by-wash channels, Dewsbury to Horbury Bridge.

2503b. P. CRISPUS var. SERRATUS (Huds.). Skating pond, Thornhill Lees.

2559. CAREX RIPARIA Curt. Great common Sedge. Willow garth, near Horbury (W. Rushforth). A relic of what was once much commoner; always indicating a low alluvial soil level.

2560. C. ACUTIFORMIS Ehrh. (*C. acuta* L.). Calder bank, Watergate, Dewsbury.

2566c. C. HIRTA var. SPINOSA Mort. Swampy ground, Horbury Bridge; Canal bank, Mirfield. An unusual form of this Sedge, 'the glume foliolating and becoming spiny,' (F. A. Lees).

2575. C. FULVA Host. Tawny Sedge. Marshy meadow, Emley Woodhouse.

2568. C. SYLVATICA var. CAPILLARIFORMIS Mihi. New to science. 'In the early part of July 1909, I first noticed this

Carex at Heybeck, near Whitkirk, on some swampy pasture land. It is a very graceful looking hair-pedicelled sedge, with recurving bright green leaves, and curving pensile spikelets. Its kinship to the wood-lover *sylvatica* was apparent, but it was not so robust as the latter species. Mr. F. Arnold Lees, has seen the plants *in situ*, and suggests that, as they shew no trace of the fruits, of hybridisation, and simulate the rare Yorkshire *Carex capillaris* in general facies, a fitting name would be *Carex sylvatica* var. *capillariformis.*' See 'The Naturalist,' 1909, pp. 349-351, with a note by Mr. Lees.

2588. C. FLACCA, Schreb. (*C. glauca* Scop). A form or state of this Sedge in moist ground, Bankwood, Emley Woodhouse. Mr. A. Bennett informs me he has also seen it in Surrey and elsewhere and that it is quite a noticeable plant.

2653. PHALARIS MINOR Retz. Old lime burning pits, Thornhill Lees.

2667. ALOPECURUS AEQUALIS Sobol. (*A. fulvus* Sm.). Margin of Lady Anne dyke, Howley.

2699. APERA SPICA-VENTI Beauv. Dirtcar side of Lusset pond, near Horbury (W. Rushforth). An alien here.

2706. AIRA CARYOPHYLLEA L. Coxley Valley (W. Rushforth and P. F. Lee). Railway embankment, Birstall; Midgley.

2717. AVENA FATUA L. Near old Soke Mills, Calder bank, Horbury (W. Rushforth); Waste ground, Dewsbury.

2732. SIEGLINGIA DECUMBENS Bernh (*Triodia*). Hilly pastures, Thornhill Edge and Howley.

2737. CYNOSURUS ECHINATUS L. Cornmill outcast, Mirfield.

2774. GLYCERIA DISTANS Wahl. An alien here on Shoddy refuse, Batley Carr.

2780. FESTUCA GIGANTEA Vill. (*Bromus giganteus* Vill.) Oakwell Wood, Birstall. (F. Arnold Lees).

2801. BROMUS ERECTUS Huds. As an alien, Willow garth, Horbury (W. Rushforth).

2806d. B. SECALINUS var. SUBMUTICUS (Reichb.). Manure heap, Ossett.

2807. B. COMMUTATUS Schrad. Meadow, Thornhill Lees.

2818. BRACHYPODIUM SYLVATICUM Roem. and Schult Arenophile, moist hedge banks; path sides, Stonecliffe Wood, near Horbury.

2821. LOLIUM TEMULENTUM L. Calder bank, Ledgard Bridge, Mirfield. Fruit very poisonous.

2821b. L. TEMULENTUM var. ARVENSE (With.). L. and Y. Goods Yard, Dewsbury. Brought with flax or oil-cake.

2849. HORDEUM MURINUM L. Way-bent. Arenophile usually. A casual on wool refuse, Batley Carr.

(To be continued).

NEWS FROM THE MAGAZINES.

In the *Entomologist's Record* (Vols. XXIV., Nos. 7 and 8: why not No. 7 ?) Col. Manders writes on the 'Value of Protective Resemblance in Moths,' Mr. H. J. Turner has a note on Nomenclature, Mr. H. C. Dollman describes *Longitarsus plantago-maritimus* sp. nov., a Coleopteron new to science, without a figure.

Mr. R. Standen contributed a paper on the 'False Scorpions of Lancashire' to the *Lancashire Naturalist*, No. 49, and in the same publication a writer, after referring to a certain journal as 'a very interesting publication which contains much of interest,' calmly proceeds to quote several pages of records therefrom.

In the *Zoologist* for July, Mr. Harvie-Brown gives some notes on the habit of the Whimbrel, and the Editor, Mr. W. L. Distant, has a note on large crabs, from which it seems that the largest crab he has been able to trace is in the museum at Hull. It weighed twelve pounds, and was caught at Brixham, Devon, in October last.

In the *Entomologist* for July, it is recorded that one market garden near Huddersfield alone supplied six thousand larvæ and pupæ of *Abraxas grossulariata* to one collector, and could probably have supplied twenty thousand. Large numbers of gooseberry bushes were absolutely stripped of every vestige of leaf. Two pairs of cuckoos got even more larvæ from the same garden.

In the *Journal of Conchology* for July, Mr. W. Denison Roebuck refers to a specimen of *Neritina fluviatilis* from Sutton Drain, near Hull, which has not hitherto been authenicated from the East Riding of Yorkshire! This statement is difficult to understand, seeing that in Petch's 'List of Land and Fresh-water Mollusca of the East Riding,' published by the Hull Club in 1904, many East Riding localities are given, on the authority of Martin Lister, Hincks, North, Hey, Christy, Butterell, Foster and Blackburn. Or is it that every record is supposed to be valueless unless it appears in the Conchological Society's voucher collection ?

In *Nature* (No. 2227) is an illustrated account of the laying of the foundation-stone of the National Museum of Wales, a ceremony which was recently performed by His Majesty the King. This was done during a brief spell of glorious weather, in beautiful surroundings, and by the kindness of the Director of the Museum, Dr. W. Evans Hoyle, a number of curators from the provincial museums had an opportunity of being present. When completed, the museum will be 440 feet long by 250 feet wide. In addition to the museum proper, there will be pavilions for Welsh History and Welsh Natural History, an aquarium, and an amphitheatre for the performance of Welsh National folk-songs and dances.

In the *Geological Magazine* for July, Mr. B. B. Woodward writes on the *Glycimeris* shell with a human face, already referred to in these columns. He is satisfied that the carving is not of Pliocene age, and suggests that it found its way into the Crag by being placed with a palæolithic burial. It is further stated that the stains are unlike the Crag staining, and it is suggested that it looked as if red ochre, as known to the ancient hunters, had been rubbed into the cut.' Hitherto the great point has been that the staining was not different from the ordinary crag stain. And surely it is hardly correct to refer to 'the impossibility of reproducing with modern tools and modern conception of the human face, even in caricature, the quaint but characteristic sculpture on the shell in question.' If anyone cares to look at *Punch* for July 17th, page 66, he will find the face in the boat, at the bottom right-hand corner, with an expression almost identical with the face on this alleged palæolithic *Glycimeris*. At the time the 'discovery' was made, it was considered to be the result of a 'joke,' probably played by a quarryman. At present, we see no reason to alter this belief.

YORKSHIRE NATURALISTS AT TANFIELD.

The third excursion for the present year was held on Saturday, the 15th June. The headquarters were at Tanfield, near Ripon, and, considering that the area suggested for investigation included the celebrated Hackfall Woods, it was natural that the botanists attended in greatest numbers, though the conchological section was also well represented. The members were again favoured with a bright, sunny day, though with a wind which made itself felt in the more open parts of the valley. Those interested in Vertebrate Zoology had as guide Mr. Riley Fortune, F.Z.S., and the botanists placed themselves under the guidance of the local schoolmaster, Mr. H. Tomlinson, and were also favoured with the company of Mr. W. D. Arton, of Tanfield Lodge, upon whose estate they passed the whole time, and to whom they were indebted for his kindness in pointing out the localities of many of the most interesting plants, and also allowing them the privilege of inspecting the gardens attached to his charmingly situated residence. In these grounds Mr. Arton has carefully preserved a portion of a finely-carved Saxon Cross, and at Stubbin Farm the members also inspected the base of a Saxon Cross, which the present occupier has preserved.

The attendance was hardly up to expectations, a score being present, and those who stayed over the week-end were able to add to the records made on Saturday .

The President, Mr. J. W. Taylor, occupied the chair at the evening meeting. Representatives of eight affiliated societies responded to the roll call, and one new member was elected.

Mr. Roebuck referred to a visit which the President and he had paid to his old friend Miss Emily Harrison, whose list of ferns of Hackfall was published in *The Naturalist* for June 1856. She still resides at Mickley Hall, is eighty-eight years of age, and, though deaf, is in good health. She is not only an accomplished botanist, but equally well versed in her knowledge of the land and freshwater mollusca of the district, of which she still retains her collection.

Cordial thanks were accorded to Mr. Riley Fortune, F.Z.S., for the excellent local arrangements made by him ; to Mr. H. Tomlinson, for acting as one of the guides ; to Mr. W. D. Arton, for permission to go over his estate, and the kindness shown to the members during the excursion ; and also to the Marquis of Ripon, Sir Willans Nussey, and Miss Staveley, for permission to visit their estates.

Flowering Plants.—Mr. J. Hartshorn writes :—A district noted for the variety and richness of its vegetation and flora did not disappoint the botanists. It was decided to work up the stream on the north side (vice county 65). Having

confirmed the records for the walls of the churchyard, the party reached the river, and saw *Conium maculatum* and *Atropa belladonna*, both plants infrequent on the western area of the Ure. The recorders were subsequently kept busy, over 240 species being recognised during the day. The two Common Figworts, *aquatica* and *nodosa*, were found growing near each other, and, as the plants were typical, the specific differences were readily seen. *Cornus sanguinea* was the hedge-former most noted, and two abnormal Limes were the most remarkable of the trees commented upon. In one nine good vertical stems grew or sprung from a common base, raised about three yards above ground on stem-like pillars, forming a buttressed foundation. Especially interesting were two meadows. In the one was an abundance of *Campanula glomerata*, the other was noted for its wealth of Meadow Saffron in leaf and fruit, and also the two orchids *Habenaria conopsea* and *Orchis morio*. Other orchids seen during the day were *Orchis ustulata, O. incarnata, O. maculata, O. mascula, Epipactis latifolia, Listera ovata* and *Neottia nidus-avis*. The last-mentioned was from the south bank (West Riding), as also were *Carex Pseudocyperus* and *Trollius europæus*. Perhaps the most interesting plant of the wet land near the river was the Columbine, *Aquilegia vulgaris*. A few of the others noted were *Primula farinosa, Ægopodium podagraria* and *Sium erectum*.

Mr. J. W. H. Johnson, who stayed over the week-end, reports that he came across a fine patch of *Botrychium lunaria*, also a white flowered form of *Ajuga reptans, Myosotis versicolor, Paris quadrifolia*, and *Erythræa centaurea*, and Mr. Wm. Cash also added *Hyoscyamus niger* and *Helleborus fœtidus*.

All records are for North Riding except those as indicated.

Mr. Wattam writes:—Maudlans Wood, which covers a large area of ground on the Tanfield side of the River Ure, County N.W., exhibits some interesting variations in its phases of ground vegetation. Taken as a whole, it is a shade wood, the dominancy of the trees practically being *Ulmus montana, Fagus sylvatica, Quercus sessiliflora, Fraxinus excelsior, Corylus avellana* and *Acer pseudo-platanus*. Also occurring are *Pinus sylvestris, Tilia europaea, Alnus glutinosa, Ilex aquifolium, Betula alba, Prunus cerasus*, and *Castanea vulgaris*. Mr. W. D. Arton informed me that the fruits of the latter tree ripened considerably in 1911, several stones in weight, fit for eating, being gathered.

On entering the wood from the direction of Tanfield Lodge, the effect of the shade canopy of the trees was evidenced by the abundance of *Mercurialis perennis, Circæa lutetiana*, and *Sanicula europæa*, with (to the right of the cart track) a great abundance of *Lastrea filix-mas*, and a slight intermingling of *Athyrium filix-fœmina*. Where felling had left an open glade,

Pteris aquilina occupied the place. There was little grass, but a great abundance of mosses and liverworts, and alongside the cart track was plenty of *Lysimachia nemorum*, and a fair sprinkling of *Myosotis arvensis*, *Primula vulgaris*, and *Campanula latifolia*, while *Anemone nemorosa*, *Ranunculus ficaria*, and *Scilla festalis* were also moderately conspicious.

On nearing the charming natural amphitheatre which is known as Hackfall, the grit rocks outcrop to a great height, and here *Mercurialis perennis* occurs in immense zones, and along with *Lastrea filix-mas* easily predominate over all other forms of vegetation. In the open place made to better admire the view, the ground in the immediate vicinity is clothed with *Teucrium scorodonia* and *Solidago virgaurea*, and here also occur *Orchis mascula* and *Blechnum spicant*. The grit rocks are prominent throughout the rest of the wood, the dominant trees in this portion being *Ulmus*, *Quercus* and *Fagus*, and the ground vegetation is almost exactly similar to that of the shade woods of the S.W. Yorkshire valleys. The sloping banks to the right are almost entirely dominated by *Scilla festalis*, with *Mercurialis perennis*, *Lastrea filix-mas*, *Holcus*, and *Sanicula europæa*. The rock ledges are the home of *Luzula sylvatica*, *Hieracium murorum*, *Lactuca muralis*, and *Melica uniflora*, and the bog areas formed at the base of the rock zone by the natural drainage, are dominated by *Allium ursinum*.

Mosses and Hepatics.—Mr. W. Ingham writes :—At a small fall on the left side of the river was a large mass of *Weisia verticillata* in fruit. This was of a lurid green, and thickly encrusted with lime. It is always quoted in books as a very rare fruiter, but here there was much fruit, due, no doubt, to its habitat under continually dripping water. Its companion, *Hypnum commutatum* was also encrusted with lime.

Trichostomum crispulum, *Hypnum falcatum* var. *virescens* and *Trichostomum tenuirostre*, were all found by Messrs. Cheetham and Johnson.

On the V.C. 65 side of the river, Mr. Barnes found the very rare moss, *Thuidium hystricosum*, so long considered a southern moss, in profusion. This find is an addition to North West Yorkshire. He continued to work the north-west side of the river after the party left Tanfield, and found the rare mosses *Bryum murale* and *Orthotrichum tenellum*, also the above-named *Thuidium* in much greater profusion.

The best Hepatic, *Pedinophyllum interruptum*, was also found by Mr. Barnes.

Fungi.—Mr. Charles Crossland writes :—Fifty-seven species of fungi were noted, all but three being from the Tanfield side of the river—V. County, N.W. There was not time to investigate both sides. *Coniophora puteana* is the only addi-

tion to N.W. Most of those seen were fairly common, and of wide distribution, but it may not be amiss to record them here under their customary habitats :—

In pastures :—*Tricholoma carneum, Marasmius oreades, Entoloma jubatum, E. sericeum, Nolanea pascua, Galera tenera, Agaricus campestris, Stropharia albocyanea, Psilocybe fæniseciі, Coprinus plicatilis, Panaeolus campanulatus, Stropharia stercoraria, S. semiglobata, Humaria granulata, Ascobolus furfuraceus, Pilobolus crystallinus,* the last six on dung.

On the ground in woods :— *Amanitopsis fulva, Omphalia fibula, Inocybe rimosa, Hebeloma longicaudum, Lactarius rufus, Boletus flavus, B. subtomentosus.*

On and near rotting stumps, mostly in woods :—*Pluteus cervinus, Hypholoma sublateritium, H. fasciculare, Psilocybe spadicea, Psathyrella disseminata, Coprinus micaceus, C. atramentarius.*

On rotting fallen branches :—*Mycena rorida, Polystictus versicolor, Fomes ferruginosus, Poria blepharistoma, Grandinia granulosa, Stereum hirsutum, Corticium calceum, Coniophora puteana, Tremella mesenterica, Calocera cornea, Eutypa lata, Lasiosphaeria ovina, Dasyscypha nivea Helotium claro-flavum.*

On decaying herbaceous stems :— *Heptameria acuta, Dasyscypha virginea, Helotium cyathoideum.*

Myxomycetes on rotting wood .—*Stemonitis fusca, S. friesiana, Lycogala epidendron, Arcyria punicea, Tilmadoche nutans.*

Parasitic on tree trunks :—*Polyporus squamosus.*

Parasitic on plants :—Æcidium stage of *Puccinia poarum* on *Tussilago farfara, P. obtegens* on *Carduus arvensis, Ustilago violacea,* on anthers of *Lychnis diurna, Podosphaeria oxyacantha* on young leaves of hawthorn, *Sphaerotheca pannosa* on leaves of Rosa.

Boletus flavus, Mycena rorida and *Tilmadoche nutans* were gathered on the Mid. W. side of the river.

A very pretty group of *Psathyrella disseminata* on decaying moss covered stump was photographed by Mr. Riley Fortune.

The Mycological Committee was represented by Messrs. Broadhead, Johnson, and the writer, assisted by Mr. J. Wms. Sutcliffe, Halifax.

Vertebrate Zoology.—Mr. Riley Fortune, F.Z.S., writes : The vertebrate section was heavily handicapped by having only one observer (the writer) in the field ; nevertheless, so rich is the district in bird-life, that sixty-eight species were noted.

The only new species added to the local list is the Turtle Dove, which was found sitting upon her two eggs in the usual apology for a nest, in a thorn bush.

In common with many other parts of Yorkshire, the district

appeared to be suffering from a scarcity of summer visitors, the Swallow tribe were not nearly as abundant as usual, but the Swifts appeared to be present in normal numbers. The Willow Warblers were exceptionally scarce, the rarer Wood Warblers being more plentiful. There appears to be a great shortage of Willow Warblers in the county, one wood near Harrogate, which usually swarms with these birds, has not a single pair this year, and only about half the usual quantity of Wood Warblers. It almost appears as if the earlier arrivals had met with some disaster, which the Wood Warblers, arriving later, had escaped.

Most of the birds seen during the day were nesting. Along the banks of the stream the Kingfisher, Dipper, Sandpiper and Grey Wagtail were seen, and a Mallard Duck was observed. leading her brood across the river. A pair of Pied Wagtails was seen about every farmstead, and several pairs of Yellow Wagtails in the fields. Only one pair of Whinchats was observed, but this species has been scarce for some years now. Four species of Tits were noticed, the absentee being the Long-tailed Tit. They were presumably all of the *British* races, and the Marsh Tits *may* have been Willow Tits.

One Woodpecker (the green) was seen, and the Great Spotted was heard, as was the note of the Nuthatch. This bird is an interesting resident, and probably here reaches the northern limit of its range.

Cuckoos were not plentiful, nor were Spotted Flycatchers, usually a very abundant species. The Pied Flycatcher was observed on the opposite bank of the river, which was in partial flood, making it impossible to wade across to look for the nest. Both the Garden and Black-cap Warblers were seen and heard, but they were not abundant, and the sibulous note of the Gold Crest was heard continually in the woods.

Birds of Prey noted were the Sparrow Hawk, Kestrel, Long-eared and Tawny Owls. the latter being most unmercifully mobbed by some Missle and Song Thrushes and Blackbirds.

One nest, evidently deserted, was found, which had every appearance of being a Goldfinch's, but, as no birds were about, one could not be quite sure. The Hawfinch is present in the district, but was not observed during the day.

Five species of mammals, one reptile, two amphibians and four fishes were noted, none of them calling for special mention. The list of fishes might have been longer, but for the fact of the river being somewhat high and discoloured.

NEUROPTERA AND TRICHOPTERA.—Mr. G. T. Porritt spent several hours working on the sides of the river Ure, but, owing to the strong wind, scarcely anything could be done, and the only species noted were *Chrysopa tenella, Perla maxima,*

Chloroperla grammatica, Hemerobius micans, Leptocerus aterrimus and *Hydropsyche augustipennis*; not one species even of these was at all plentiful.

ARACHNIDA.—Mr. Wm. Falconer writes:—The route followed by the solitary arachnologist present led along the north bank of the river to Tanfield Hall, and thence along the south bank through Mickley and Hackfall Woods. The nature of the ground varied considerably, and many methods of collecting were resorted to, but time did not permit of a thorough examination being made anywhere. Especially was this to be regretted in the case of Hackfall, which furnished not only the greater number, but also the more uncommon spiders, and the *Chthonius rayi* L. Koch (10 examples), met with during the day. These, with a few exceptions, notably *Philodromus dispar* Walck and *Metopobactrus prominulus* Cambr., are common and widely distributed Yorkshire species. but as the district investigated had not previously been worked for its arachnida, they are given in extenso below—fifty species of spiders, three harvestmen, and two pseudoscorpions.

Harpactes hombergii Scop.
Oonops pulcher Templ.
Clubiona reclusa Camb.
C. lutescens Westr.
C. comta C. L. Koch.
Zora maculata Bl.
Amaurobius fenestralis Stroem.
Coelotes atropos Walck.
Theridion sisyphium Clerck.
T. denticulatum Walck.
T. pallens Bl.
Pholcomma gibbum Westr.
Phyllonethis lineata Clerck. and var. *redimita* Koch.
Robertus lividus Bl.
Linyphia montana Clerck.
L. peltata Wid.
L. hortensis Sund.
L. clathrata Sund.
Labulla thoracica Wid.
Leptyphantes terricola C. L. Koch.
L. blackwallii Kulcz.
L. obscurus Bl.
L. pallidus Bl.
Bathyphantes dorsalis Wid.
B. nigrinus Westr.
Poeciloneta globosa Wid.
Macrargus rufus Wid.
Oreonetides abnormis Bl.
Microneta viaria Bl.
Maso sundevallii Westr.
Gongylidium rufipes Sund.
Œdothorax tuberosus Bl.
Lophomma herbigradum Bl.
Dicymbium nigrum Bl.
Neriene rubella Bl.
Diplocephalus latifrons Camb.
D. picinus Bl.
D. cristatus Bl.
Entelecara erythropus Westr.
Pocadicnemis pumila Bl.
Metopobactrus prominulus Camb.
Walckenaera acuminata Bl.
Cornicularia cuspidata Bl.
Ero thoracica Wid.
Tetragnatha solandrii Scop.
Meta segmentata Clerck.
M. merianae Scop.
Nesticus cellulanus Clerck.
Philodromus dispar Walck.
Lycosa amentata Clerck.

Liobunum rotundum Latr.
Platybunus triangularis Herbst.
Oligolophus morio Fabr.

Chthonius rayi L. Koch.
Obisium muscorum Leach.

MOLLUSCA.—Mr. Wm. Cash, F.G.S., writes:—The search for mollusca at Tanfield and Hackfall was not very successful, the height of the Ure precluded much collecting therein. The one or two small ponds and the ditches also proved disappointing. For some reason or another, and quite contrary to one's

anticipations, shells generally were few, both in species and in individuals. Perhaps the most interesting shell found was *Acanthinula lamellata* among dead beech leaves in Hackfall Woods.

Appended is a list of shells recorded by myself and one or two other members of the Union, a total of thirty-two species

Agriolimax agrestis (Linné).
A. lævis.
Vitrina pellucida (Müller).
Vitrea crystallina (Müller).
Hyalinia helvetica (Blum.)
Polita cellaria (Müller).
P. alliaria (Müller).
P. pura (Alder).
P. radiatula (Alder).
P. nitidula (Drap).
Euconulus fulva (Müll).
Arion ater (Linné).
A. hortensis.
A. circumscriptus.
A. intermedius.
Sphyradium edentulum (Drap.)
Goniodiscus rotundata (Müll.)
Heliomanes virgata (Da Costa).
Hygromia granulata (Alder).
H. rufescens (Penn).
H. hispida (Linné).
H. hispida (Linné) var. *hispidosa* (Mons.).
Acanthinula lamellata (Jeffry).
Helicogona aspersa Linné.
Cepæa nemoralis Linné.
C. hortensis Müll.
Cochlicopa lubrica Müll.
Azeca tridens (Pulteney).
Pirostoma bidentata (Ström).
Carychium minimum Müll.
Ancylus fluviatilis Müll.
Radix peregèr (Müll. Sm.).

W. E. L. W.

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FIELD NOTES.

Death's Head Moth at Arncliffe.—A Death's Head Moth was found by two boys on the village-green on Saturday, June 8th last. I am not aware that a specimen of this beautiful moth has ever been seen before in this valley, which is 750 feet above the sea at the place where the moth was taken.—W. A. Shuffrey, Arncliffe Vicarage, June 12th, 1912.

***Leptothorax acervorum* in North-East Yorkshire.**—When at the British Museum lately, Mr. Meade-Waldo showed me an insect of which Mr. Donisthorpe desired to know the locality. It was in the Saunders collection, and when looked at with a lens the label was plainly 'Goathland,' in N.E. Yorkshire, but by whom or when it was taken is not evident. This is an important record for our county.—W. Denison Roebuck, Leeds, 21st June, 1912.

Rhyncholophus niger.—During the last month I received from Mr. W. P. Winter, of Shipley, some mites, among which I found a *Rhyncolophus* new to me. It was in colour a deep black, but in other respects it resembled *R. communis.* No new figures are therefore necessary as those in *The Naturalist* for December 1910, page 428, will serve every purpose. I may say that the mandibles which are not there figured, are sword-like, and I could see no serrations such as are seen in *Erythræus* (this should be *Ritteria*) in the May number of *The Naturalist* for 1907, page 180.—C. F. George, Kirton-in-Lindsey.

YORKSHIRE NATURALISTS AT ASKERN.

MEMBERS of sixteen societies joined in the excursion to Askern, Sutton Common and Shirley Pool on Thursday, July 11th. Excellent local arrangements had been made by Mr. H. H. Corbett for the general body of naturalists, who were conducted over the boggy labyrinth of Sutton Common and the adjoining woods. Askern is being rapidly transformed from a quiet country spa to a busy mining town, and the huge pit heaps

Photo by] [*H. G. Brierley.*

Shirley Pool.

have permanently altered its general aspect. In these, however, the geologists, who were accompanied by Mr. H. Culpin and Mr. J. W. Stather, found much interesting material for study. Mr. J. Humble kindly gave permission to visit the collieries, and Mr. W. A. Wallis granted a similar privilege to examine the clay pits.

Members of the other sections were met on Sutton Common by Major C. Anne, of Burgwallis, who very kindly had three trenches cut through portions of the Neolithic earthworks on his estate. He also exhibited a number of interesting remains found during the excavations, including flints, fragments of pottery, sling stones and wooden piles. One of the trenches showed a considerable length of rough walling.

At Shirley Pool a boat was placed at the disposal of the

members, and proved of great use in inspecting at close quarters the inner margin of the reed vegetation, by which the pool is surrounded, and also in searching the deep mud for molluscs.

A large number of members attended the meeting held later in the day at the Railway Hotel, Askern. The President, Mr. J. W. Taylor, occupied the chair, and sectional reports were given on the day's work by Mr. H. Culpin, Dr. T. W. Woodhead, Prof. J. H. Priestley, Messrs. C. Cheetham, W. N. Cheesman, W. Denison Roebuck, H. H. Corbett, E. G. Bayford, and Dyson. In all sections except Entomology, interesting results were obtained, and the meeting was obviously enjoyable and successful. The President expressed the pleasure of the members in being favoured by the presence of Mr. T. Bunker, of Goole, who for so many years has been a steady supporter of the Union, and one of its oldest members. Hearty thanks were accorded to Major Anne and Messrs. Humble and Wallis, for the privileges granted, and to the leader and local secretary, Mr. Corbett.

Respecting the pre-historic earthworks on Sutton Common, Mr. C. E. C. Anne writes :—About three-quarters of a mile south of Askern, on the low-lying marshy tract known as Sutton Common, are some interesting earthworks. These, apparently, form two distinct camps, east and west of each other, and are defended on all sides by ditches and earthen ramparts. The camp to the east of the Common is the larger, and the more interesting, as here the remains are particularly distinct, and one can clearly see the hut circles placed round the edge of the camp, behind the defences.

In this camp the defences on the north-east are three times as strong as elsewhere, and here are seen no fewer than four ditches, and three earthen ramparts thrown up between them. This strengthening of the defences is particularly striking, and extremely well-preserved. It is suggested that the country on the north-east was less marshy, and hence the camp was more liable to attack from that quarter.

Within the defences the ground is raised above the surrounding land, and would be quite dry, even in times of flood.

Two entrance gateways in the defence can clearly be discerned on the north and east—the latter being defended without by a flanking earthwork.

The hut circles differ from each other in size, and some are oblong. Remarkable quantities of oak ashes are found on excavation, and would almost lead one to conclude that the stockades and dwellings had, at one time, been razed to the ground by fire.

The distance between the camps is, perhaps, from eighty to one hundred yards—the western camp being similar to the other, but of about half the area.

We can imagine that in times of peril the ancient people would leave their pleasanter dwellings on the uplands to the west, and, with their families and cattle, seek refuge here among the stagnant swamps.

There are still those living who can remember the Common before the drainage system intruded itself, when it was seldom visited by anyone, save perchance, a sportsman in search of wild fowl.

These earthworks owe their remarkably distinct state of preservation in no small measure to their isolated position, and, although they have not, as yet, been investigated to any extent, they may be expected to yield some interesting 'finds' in the future.

Geology.—Mr. H. Culpin writes:—A visit was made to the colliery tip, and the party had the pleasure of discovering some material which had been brought up on the previous Monday, from one of the marine bands passed through in the sinking. This they found contained *Lingula mytiloides*, and fish scales. They also obtained fossils from the prinicpal marine band of the district, the order of position in which, from the top to the base, is as follows:—

Blue-grey shales, having a soapy feel, with fucoids.
Blue-grey shales, having a soapy feel, with *Lingula mytiloides.*
Blue-grey shales, as above, but tending to grey, with *Ctenodonta lævirostris, Pterinopecten papyraceus*, etc., etc.
Dark grey shales, slightly speckled, and somewhat rough in appearance, with *Pterinopecten papyraceus, Posidoniella lævis, Goniatites, Orthoceras*, etc., etc.
Dark limestone.

A cutting, which showed on one side contorted Middle Permian Marls faulted against broken Upper Permian Limestone, and on the other side the massive Lower Permian Limestone faulted against bent Upper Permian Limestone, was inspected. Close by, traces of the Upper Permian Marls were noticed lying on the Upper Limestone. In an adjacent clay pit, the Middle Permian Marls with gypsum beds, were seen in some freshly cut sections.

A return was then made to the colliery tip for the purpose of examining the grey marls from the base of the Permian Series. These yield *Schizodus obscurus*. The limestone immediately above these shales contains *Productus horridus, Camarophoria schlotheimii, Fenestella, Penniretipora*, etc., and there are also some traces of copper ore.

An inspection followed of the inclined Upper Permian

Limestone forming Askern Mount. Triassic (Bunter) sand was seen in section below the limestone gravels in the adjoining gravel and sand pit, and an interesting discussion took place as to the relation of the sand to the limestone. A suggestion was made by the writer that the Mount is an instance of an overthrust fault.

At the subsequent meeting, the thanks of the Geological Section were given to Mr. J. W. H. Johnson, B.Sc., for his report on the composition of the Upper Permian Limestone in South Yorkshire (*Naturalist,* September 1911, p. 308). This report arose out of a discussion which took place at the Yorkshire Naturalists' Union Meeting at Askern in 1906.

Botany.—Dr. Woodhead writes :—The neighbourhood of Askern possesses many features of interest to botanists. Sutton Common is a grassy marsh with numerous water-logged hollows, pools and drains supporting a rich marsh and aquatic vegetation. The ground-water is very high, as indicated by the abundance of such plants as Marsh Pennywort (*Hydrocotyle vulgaris*), Amphibious Bistort (*Polygonum amphibium*), Lady's Smock (*Cardamine pratensis*), Spearwort (*Ranunculus Flammula*), Flea Bane (*Pulicaria dysenterica*), Marsh Arrow-grass (*Triglochin palustre*), and Marsh Orchis (*Orchis latifolia*). Prominent features in the flora were masses of Meadow Sweet (*Spiræa Ulmaria*) and meadow rue (*Thalictrum flavum*) in full flower, and around the pools a reedy belt of the Common Reed (*Phragmites vulgaris*), Cut-sedge (*Cladium Mariscus*), Yellow Iris (*Iris Pseudacorus*), Bur-reed (*Sparganium simplex*), Purple Loosestrife (*Lythrum salicaria*), Water Figwort (*Scrophularia aquatica*), and at Shirley Pool, in addition to the above, were the Great Water-Dock (*Rumex Hydrolopathum*), Water Plantain (*Alisma plantago*), Greater Spearwort (*Ranunculus lingua*). Reed-Mace (*Typha angustifolia*), Cyperus Sedge (*Carex pseudo-cyperus*), and in the adjoining Shirley Jungle the Marsh-fern (*Dryopteris Thelpyteris*) grows abundantly among the reeds in the Alder-Willow Swamp. On the sides of the drains were several rushes (*Juncus supinus, conglomeratus* and *glauca*), also Water Dropwort (*Œnanthe fistulosa*), Celery-leaved Crowfoot (*Ranunculus sceleratus*), Brook-weed (*Samolus Valerandi*), Brook-lime (*Veronica Beccabunga*).

In the water were the Marestail (*Hippuris vulgaris*), Water Crowfoot (*R. trichophyllus*), Water Speedwell (*V. Anagallis*), Water Cress (*Radicula Nasturtium*), Horned Pondweed (*Zannichellia palustre*), Plantain leaved Pondweed (*Potomogeton coloratus*), and Water Starwort (*Callitriche intermedia*). In the fields adjoining the Common, the Hawksbeard (*Crepis taraxacifolia*) was found.

Fungi.—Mr. W. N. Cheesman reports :—The writer and Mr. J. W. H. Johnson investigated the woods adjoining Shirley

Pool, and sixty-one species were observed, a few being new records for the district. The edible *Amanita rubescens* was seen in great abundance, also a number of the usual species of *Mycena* and *Marasmius.*

The rare *Polyporus alutaceus* was found, and has been determined by Mr. Crossland.

A number of fairly common Ascomycetes were observed, including *Lachnea erinacea.*

The Myxos. included *Arcyria pomiformis,* the second Yorkshire record for this minute organism.

Total collected and observed :—

Agarics	15
Polypores	8
Thelephoras, etc.	10
Ascomycetes	12
Mycetozoa	16
	61

For the Micro Section, Mr. M. H. Stiles reports as follows :—In making our gatherings at Shirley Pool, we had the advantage of the use of a boat, and thus were enabled to reach portions of the Pool which otherwise would have been inaccessible.

Using the collecting apparatus as a tow-net, we secured samples of the Plankton life of the Pool, consisting mainly of Rotifers, which were sent on to Mr. H. Moore, of Rotherham, for determination. He states :—'The tube sent was very satisfactory, containing *Anuræa aculeata* Ehr, *Anuræa cochlearea* Gosse, *Asplanchna brightwelli* Gosse, *Brachionus angularis* Gosse, and *Pomphalyx sulcata* Hudson. The two species of Anuræa are common in most places, but the other three species I rarely meet with about this district.'

The fresh-water Sponge, *Spongilla lacustris,* was much in evidence, a submerged branch being almost completely covered with this interesting type.

Floating on the water were found two olive-green gelatinous masses, one of them of comparatively large size, about 1½ inches by 1¾ inches and ½ inch thick, which Mr. W. West was good enough to examine. It proved to be *Aphanothece prasina,* a species not recorded in his 'Alga Flora of Yorkshire.'

Diatoms.—The following list comprises those at present determined, but further examination will doubtless result in an extension, which I hope to communicate to a future issue.

The genera most abundant were *Diatoma, Gomphonema, Epithemia, Cymbella* and *Synedra.*

Amphora ovalis Kutz.
,, ,, var. *affinis.*
Cymbella Ehrenbergii Kutz.
,, *cuspidata* Kutz.
,, *gastroides* var. *minor* Kutz.
Cymbella lanceolata Ehr.
,, *Cistula* Hempr.
,, ,, var. *maculata.*
,, *obtusa* Greg.
Encyonema prostratum Ralfs.
,, *caespitosum* Ralfs.
Stauroneis acuta W. Sm.
Navicula oblonga Kutz.
,, *gracilis* Kutz.
,, *radiosa* Kutz.
,, ,, var *acuta.*
,, *rhyncocephala* Kutz.
,, *humilis* Donk.
,, *cuspidata* Kutz.
,, *sculpta* Ehr.
,, *limosa* Kutz.
,, *iridis* var. *amphirynchus* Ehr.
,, *lanceolata* Kutz.
Pleurosigma attenuatum W. Sm.
,, *Spencerii* W. Sm.
Gomphonema constrictum Ehr.
,, ,, var. *capitatum.*
,, ,, var. *curta.*
,, *acuminatum* Ehr.
,, ,, var. *coronatum.*
Gomphonema gracile Ehr.
,, *montanum* var. *subclavatum* Schum.
,, *parvulum* var. *lanceolatum* Kutz.
Rhoicosphenia curvata Grun.
Cocconeis pediculus Ehr.
,, *placentula* Ehr.
,, ,, var. *lineata.*
Epithemia turgida Ehr.
,, *gibba* var. *ventricosa* Kutz.
,, *sorex* Kutz.
Eunotia lunaris Ehr.
,, *exigua* Breb.
Synedra Ulna Nitzsch.
,, ,, var. *lanceolata*
,, *acus* Kutz.
Fragilaria capucina Desmaz.
,, ,, var. *acuta.*
,, ,, var. *mesolepta.*
,, *construens* Ehr.
,, *Harrisonii* W. Sm.
,, *tenuicollis* var. *intermedia* Heib.
Diatoma elongatum Ag.
Cymatopleura elliptica Breb.
,, ,, var. *hibernica.*
,, *solea* Breb.
Nitzschia Sigmoidea Ehr.
,, *Hungarica* Grun.
,, *vitrea* var. *recta* Norman.
Cyclotella Meneghiniana Kutz.

The Coleoptera Committee was represented by Messrs. E. G. Bayford and H. H. Corbett. Beetles were scarce, a remark which applies with equal truth to the other orders of the Insecta. Perhaps the most noticeable was a male specimen of *Strangalia armata* Herbst., in which the black markings were increased to such a degree as to reduce the yellow ground colour to very small dimensions. The other species noted were all common ones :—

Harpalus ruficornis F.
Pterostichus diligens Sturm.
Haliplus fulvus F.
Hyphydrus ovatus L.
Hydroporus pictus F.
Malthodes marginatus Latr.

NEUROPTERA.—*Panorpa communis* L. was one of the commonest of insects near Shirley Pool : a female specimen was brought to the meeting in order to draw attention to the scorpion-like terminal abdominal segments. T. W. W.

——: o :——

In *Knowledge* for July, Mr. A. M. Broadley contributes a well-illustrated article, entitled ' A Knowledge of the Origin and Early History of the Royal Horticultural Society as derived from contemporary medals, caricatures and other rararia.'

THE MUSEUMS' ASSOCIATION.

Alderman JOHN BROWN.

The Annual Conference of the Museums' Association was held in Dublin, from July 8th to July 13th, at which the invitation for the conference to be held in Hull in 1913 was unanimously accepted.

The Conference was well attended by the curators and representatives of the Committees, etc., not only of all the provincial museums, but also of the various English, Scottish and Irish National Museums and Art Galleries. There were also representatives from America.

A strong local Reception Committee had been formed, and took in hand the various local arrangements, which were admirable.

Count Plunkett, the Director of the Irish National Museum, was the President, and the meetings were graced with the presence of the Lord Lieutenant of Ireland (Lord Aberdeen) and Lady Aberdeen, who also invited the members to their residence, and at the annual dinner Lord Aberdeen made many sympathetic references to the work of the Association; in fact, all through it was evident that the Irish people had done all in their power to make the Conference a success.

There were several papers bearing upon the work of Museums and Art Galleries, and from these many useful hints were obtained.

Opportunities were afforded for examining the art treasures and the natural history and archæological collections in the National Museum, the National Gallery, Trinity College, and many other institutions. Visits were also paid to the excellent zoological gardens, botanic gardens, Phœnix Park and the Vice-Regal Lodge, etc., The social side of the meeting was well catered for by Lord and Lady Aberdeen's garden party already referred to, a garden party at the beautiful residence of Sir John and Lady Nutting at St. Helens, Co. Dublin, a conversazione in the National Museum, and an excursion to Glendalough, where many Irish antiquities were seen.

Among the papers read and discussed were the Presidential Address: 'The Influence of Museums on the Reform of Classical Studies' by Professor Henry Brown; 'American Museums and School Work,' by Dr. F. A. Lucas; 'Old and New Classifications of Stone Implements,' by R. Smith, F.S.A.; 'The Preservation and Storing of Bird Skins,' by Professor C. J. Patten; 'A New Method of Exhibiting Geological Specimens in Wall Cases,' by Professor Seymour; 'The Rating of Museums and Art Galleries,' by Mr. H. V. Hodgson; 'The Relation of Schools of Art to Museums,' by Mr. J. Ward,

A.R.C.A. ; ' The Necessity for Aesthetic Harmony between Museums and Galleries and their Contents,' by Sir Walter Armstrong ; ' Art and the Child,' by Mr. Percy Bates ; ' The Organization of Exhibitions of Foreign Art in England,' by Mr. H. D. Roberts ; ' The Care of Paintings, Drawings, Engravings and other Art Treasures,' by Mr. E. R. Dibdin ; ' The Exhibition of Reproductions of Greek Sculpture,' by Mr. H. H. Mullen ; ' The Bird Collections at Dublin,' by Mr. A. R. Nichol ; ' Experiments in Museum Work,' by Mr. E. L. Gill ; ' The Artists and the Gallery,' by Mr. D. O'Brien ; ' The Dry Sand Process for Cleaning Skeletons,' by Dr. R. F. Scarff ; ' Ventilation and Humidity of the Atmosphere in Museums,' by Dr. F. A. Lucas ; ' Museum Guides : Real and Ideal,' by Mr. T. Sheppard.

A public lecture was given on Friday by the Director of the Welsh National Museum (Dr. W. E. Hoyle) on ' Museums : Interesting and Otherwise.' In addition to the preceding, there were many informal discussions bearing upon various subjects.

The Local Committee presented each delagate and associate with an admirable guide to Dublin, and the members also had facilities with regard to railway and tram rides, etc.

For the 1913 Conference, which will be held at Hull a year hence, Mr. E. Howarth, F.Z.S., F.R.A.S., Curator of the Sheffield Museum and Art Gallery, will be President, and it is a compliment to Hull that Mr. Sheppard is one of the two Vice-Presidents.

In the *Entomologist's Record* (Vol. XXIV., No. 6), Prof. T. Hudson Beare gives a ' Retrospect of a Coleopterist for 1911.'

In the *Irish Naturalist* for July, Prof. Patten has a paper on ' Wrens on Migration observed at the Tuskar Rock and Lighthouse.'

' On the Recognition of two stages in the Upper Chalk ' is the title of a paper in the *Geological Magazine* for July, by Mr. Jukes-Brown.

' The Thatching of Ricks ' is a useful paper in the *Journal of the Board of Agriculture* for July. The Board has also issued a pamphlet on Mustard Beetles, as Leaflet No. 163.

The Micrologist for July contains a well-illustrated article on the Common Starfish, by G. A. McKechnie, and another on ' Vernal Unfolding and Autumn Defoliation,' by Abraham Flatters.

Obituary notices in reference to R. W. C. Shelford, J. G. Keulemans, and E. A. Fitch, appear in the *Zoologist* for July, and to Prof. J. B. Smith, in the *Entomologist's Record* recently published.

The *Nature Photographer* contains an editorial note emphasizing the great difficulties of nature photography (which, by the way, we hardly agree with), and Mr. E. J. Bedford has an illustrated note on British Orchids.

In the *Entomologist's Monthly Magazine* for July, Mr. N. H. Joy provides a Table of British Species of the Coleopterous Genus *Gyrophæna* ; the Rev. F. D. Morice contibutes ' Help Notes towards the determination of British *Tenthredinidæ*,' and Dr. J. H. Wood supplies ' Notes on British *Phora*.'

Naturalist,

NOTICE.

The **Annual Meeting** of the **Marine Biological Committee** will take place at **Robin Hood's Bay, October 11-15.** Professor Garstang of Leeds, and Professor Denny of Sheffield University, have kindly consented to allow the use of the Marine Laboratory, lately instituted there, as the centre for meetings and work. It is hoped that many members will avail themselves of the special opportunities of studying marine life in its various forms. All communications with respect to it should be addressed to Rev. F. H. Wood, Bainton Rectory, Driffield.

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Denticulated Structure of the Hinge-line of *Spirifera trigonalis*. J. Young.
Oscillation of Level: South Coast since the Human Period. J. Gardner.
Canadian Archæan or Pre-Cambrian Rocks and the Irish Metamorphic Rocks. G. H. Kinahan.
Histianotus angularis at Herstan. J. C. Mansel-Pleydell. (Plate).
Statical and Dynamical Metamorphism. J. W. Judd.
Creeping of the Soilcap through the Action of the Frost. C. Davison. (Illus.).
Wicklow Greenstones. F. H. Hatch;
Relations between *Syringolites* and *Roemaria*. H. A. Nicholson.
On the Proboscidea. E. D. Cape. (Plate).
New Jurassic Fishes. A. S. Woodward.
Variations of Climate. E. Jaderin.
Structure of Rhobell Fawr. M. M. Cole and Holland. (Illus.).
Bubalus bainii. H. G. Seeley. (Illus.).
Levcillia. E. B. Newton. (Plate).
Rocks from the Tonga Islands. A. Harker.

NOTES AND COMMENTS.

THE NATIONAL TRUST.

We have received the annual report of the National Trust for places of Historic Interest or Natural Beauty, issued by the Secretary, from 25 Victoria Street, Westminster. It contains an extraordinary record of the excellent work the Trust is performing in the preservation of monuments, be they natural or artificial ; and all naturalists must appreciate the way the Trust is securing commons and other sanctuaries from the maw of the speculative builder, and from the too enthusiastic attentions of the collector and 'tourist.' Many pages are devoted to descriptions of the Trust's property, and an appeal is made for nearly £4000, still required in order to obtain possession of Colley Hill, Mariner's Hill, Minchinhampton Common, Buckingham (Chantrey Chapel) ; and the Roman Fort, Ambleside. We would like to suggest that, instead of erecting marble angels to the memory of one's relatives or friends, there would be a much more useful and more permanent memorial if the money were sent to the secretary of the National Trust.

EXEUNT

On the last page of part 8 of the third volume of the Bradford Scientific Journal, occurs the following note :—' The editors regret to announce that the Council of the Bradford Scientific Association have decided that the publication of this journal must now be suspended.' We are sorry to learn this, and though no reason is given, it will doubtless be due to the question of funds. Judging from the present part it cannot be that contributions are not forthcoming. The journal has followed many others that have started in the county, and, oddly enough, volume III. seems to be about the average extent of the publications. In view of the fact that Bradford is so important a scientific centre, and was also fortunately situated as regards financial assistance for its journal, the decease of the publication should be taken to heart by other societies who may be contemplating publishing a magazine. In the Bradford Scientific Journal are many important papers, which will be increasingly difficult to consult as years go on, and copies become scarcer. We trust that our Bradford friends will see that complete sets are placed in as many public libraries as possible, and private individuals who possess sets should see that they are bound up. We know from experience how soon such things are forgotten, and, after a lapse of a very few years, how difficult they are to obtain. As an instance we may mention the Barnsley Society's former quarterly publication, which we have not yet been able to obtain, though we have tried for the past fifteen years.

THE BRADFORD SCIENTIFIC JOURNAL.

The part before us contains a summary of what is known of the sources of the River Aire, by Mr. J. E. Wilson ; Mr. H. E. Wroot writes about an Old Bradford Botanist (Dr. Richard Richardson) ; Mr. A. Wilson refers to Sea Spray carried inland ; Mr. C. A. E. Rodgers gives a list of the Macro-Lepidoptera in the Eshold District ; Mr. W. Leach has a paper on the ' Soft Waters of the Bradford Area,' and Mr. J. Bradley describes the Cloudberry. There are also articles on ' A Problem of Food Supply,' 'A Glacial Geologist's Note Book' (in which the work of the late Carvill Lewis, in the Bradford area, is summarised), and a New Wild Rose Hybrid, found in Upper Wharfedale, by Mr. Samuel Margerison, and named *Rosa margerisoni*.

PREHISTORIC THORPE.

There is also an article by ' The Grassington Antiquary ' (as the local picture postcards describe Mr. J. Crowther), in which he adds ' another link to the chain of antiquarian discoveries made in Upper Wharfedale during the past twenty-four years', though we believe the district yielded many important relics prior to that date. The present link refers to some bones and a piece of pottery with ' fish-bone ' (? herring-bone) markings, found while removing stones on a knoll. Mr. Crowther opines that the remains are ' contemporary with human bones discovered in Elbolton Cave, in the year 1888,' though the evidence for such a conclusion is not given. And the presence of one or two flint scrapers is certainly not ' additional and undeniable proof of the antiquity of the relics ' as it is quite possible they have no connection with the human remains at all. Nor are we at all satisfied that ' the new discovery clears up the mystery that these ancient cave dwellers, or hunters of the wild boar, brown bear, grizzly bear and cave bear, had been interred outside ' the cave. No evidence is given of any connection between the two. Mr. Crowther also complains that a recent work on Roman roads ' never mentions either sites of Roman British [sic] camps in Upper Wharfedale, of which I know of no fewer than six.' Is it not possible that the author of the book referred to may not attach quite the same importance to the six ' Roman British sites ' that Mr. Crowther, who is ' working alone on these hills,' does ?

SEVENTEENTH CENTURY SCIENCE.

Mr. A. M. Broadley, in *Knowledge* for August, gives an interesting account of the early scientific instrument-makers, deducting many of his facts from the wonderful collection of trade cards which he possesses, and from which he has taken his illustrations. We learn that it was a cousin of Sir Isaac Newton who founded the business of Newton & Company,

which has just recently removed from Fleet Street to Wigmore Street and Covent Garden, and that John Dolland, who in 1750 founded the still-existing firm with its branches east and west of Temple Bar, was a distinguished Fellow of the Royal Society, and was awarded the Copley gold medal of that body in 1758. Mr. Broadley also tells us that a balance made in 1757 by De Grave, Short & Company, is still used by Messrs. Garrard, the Court Jewellers: All who are interested in the development of instruments will learn a great deal from those which are figured on the various trade cards, and were sold at the sign of the Azimuth Compass, the Golden Lion, or the Globe and Sun.

THE ORIGIN OF LIFE.

The Origin of Life is the title of the Presidential Address to the Birmingham and Midland Institute Scientific Society, by Dr. John Hall-Edwards.* The author is evidently impressed with the fact that Leduc ' proves that neither evolution, nutrition, sensibility, growth, organisation, not even the faculty of reproduction, is the exclusive appanage of life, and that the same physical forces acting upon the same chemical elements are common to both the organic and inorganic worlds.' He also refers to Dr. Bastian's experiments, when he ' confined certain superheated saline solutions in hermetically sealed glass vessels, which, after being exposed to daylight for several months, were opened, and the slight amount of precipitate examined under the microscope has been found to contain living organisms. If these results can be substantiated, we shall, I am afraid, have to swallow the bitter pill, and accept spontaneous generation as a fact.' *If.* We suppose there was some reason for printing the pamphlet on pages of the size of those of a family bible, though, personally, we can see no reason why it could not have been printed ordinary octavo size.

CARLISLE NATURALISTS.

We have again to congratulate the Carlisle Natural History Society upon the care with which its Transactions have been produced. Volume II., for 1912, is before us, and every one of its 256 pages bears upon the Carlisle district, and contains original observations, devoid of talky-talky padding. The editors are Messrs. Day, Hope and Murray. The first article is an appreciative memoir on the late H. A. Macpherson, M.B.O.U., with portrait, and is written by the Curator of the Museum, Mr. Linnaeus Hope. Mr. J. W. Branson gives an exhaustive account of the Minerals of Cumberland; Mr. H. Britten, a lengthy account of the Arachnids (Spiders, etc.),

* 16 pp. London: Rebman, Ltd. 6d.

of Cumberland, enumerating over three hundred species; Mr. T. S. Johnstone writes on 'Plant Life around Carlisle'; Mr. E. B. Dunlop contributes 'The Natural History of the Peregrine Falcon in the Lake District.' The longest contribution is 'The Lepidoptera of Cumberland, Part II. (Moths)', by Mr. G. B. Routledge, and occupies 90 pages. Mr. Hope follows with a detailed description of the 'Ducks and Geese of the Solway,' and 56 pages are occupied by Part II. of Mr. F. H. Fay's 'Coleoptera of Cumberland.' Would that all our provincial societies were as careful with their publications as is the Carlisle society. There is only one improvement that we should like to suggest, and that is that in future the volume should be lettered on the back, so that it can be found when on the shelf.

GLASGOW GEOLOGISTS.

The *Transactions of the Geological Society of Glasgow** contain a lengthy paper on 'The Carboniferous Limestone Rocks of the Isle of Man,' by Mr. John Smith. From this we learn that during the ten weeks he hammered at the Manx Carboniferous rocks, he added 377 species and varieties to the Government list, including 2 genera and 30 species new to science. This seems to be an almost incredible performance. He figures and describes three new species, viz.:—*Michelinia balladoolensis, Æchmina carbonifera*, and *Mona monensis*. He also figures some 'diseased fossils.' 'The brachiopods (probably from their sedentary habits), were by far the most afflicted, *Productus and Orthis* having suffered more than others, *perhaps from hereditary complaints of the internal organs*.' Mr. Smith also refers to the glacial deposits of the island, from which it is apparent he can no more subscribe to the views of Lamplugh, in reference thereto, than we can to the views of John Smith. There are many illustrations from photographs, in most of which a gentleman, possibly the author, is shown as standing, sitting, crouching, stooping, sleeping, etc.

CHANGES IN THE LOWER DEE VALLEY.

In the Quarterly Journal of the Geological Society, No. 270, Mr. L. J. Wills has a paper on 'Late Glacial and Post-Glacial Changes in the Lower Dee Valley.' In this he concludes that, owing to the obstruction of the peculiarly serpentine course of the whole valley of the Dee, near Llangollen, by ice and glacial deposits, overflow channels across the necks of several loops were initiated. Two of these have become permanent on the retreat of the ice, and are now river-gorges, while the loops are left as dry valleys. Near Cefn the river enters a long post-glacial gorge, which extends to beyond Overton Bridge.

* Vol. XIV., Part II.

The pre-glacial valley of the Dee is traceable beyond Chirk in a south-easterly direction to near St. Martin's Moor. The drift-filled valley shown by Dr. Strachan to exist below the estuary of the Dee and as far south as Pulford, extends to Rodens Hall, near Bangor-on-Dee, where it is still 30 feet below sea level. This indicated a much steeper pre-glacial 'thalweg' than the present one. An attempt is made to prove that these two valleys are continuous, although the intermediate portion is obliterated by Drift. The question is raised whether the uplift during which the erosion of this deep buried valley took place was pre-glacial, or whether it occurred during the Glacial Period. The evidence is far from conclusive, but, in the opinion of the author, appears to point to the latter view.

GUIDE TO THE NATIONAL READING ROOM.*

Many of our readers have doubtless found it necessary to consult the world's greatest library at the British Museum, in connection with their researches. And doubtless many have wasted a day or more through not knowing the proper way to go about. In Mr. Peddie's handbook, all this is clearly explained, and many useful hints are given as to the best and simplest way of making the most of the library while there. The author also has serviceable chapters on the various catalogues, bibliographies, etc. The 'one outstanding special collection of books' in the museum is the library of Sir Joseph Banks. Information is given in reference to all the departments in the museum reading room, from maps and newspapers to Hindi, Panjabi, Sindh, and Pushtu. Oddly enough, the one book selected from the four million volumes for a sample entry in the general catalogue, is before the present writer at the moment, having been sent 'with the kind regards' of the author. Possibly Mr. Peddie has been similarly regarded. We suppose the author had an object in producing his handbook the size and shape of a prayer-book, but it would surely have been more useful and less liable to get lost had it been octavo size, and then the 'Table of Subjects' need not have been folded into eight, with the result that it is sure to get torn; in fact, ours was on arrival, possibly through some inquisitive person examining the book before it reached us.

In the *Journal of the Linnean Society*, No. 277, Prof. Herdman describes *Amphidinium operculatum*, a new British record. The species discoloured the ripple-marked sand in the Isle of Man.

Among the articles in the well-illustrated *Nature Book* now being issued by Messrs. Cassell & Co., are the Cliffs and their Story, The Life History of a Mountain, Rock Garden, and Summer Insects.

* The British Museum Reading Room: A Handbook for Students, by R. A. Peddie. London: Grafton & Co., 61 pp., 1/-.

LAMPROPHYRE DYKES IN LONG SLEDDALE, WESTMORLAND.

ALFRED HARKER, M.A., F.R.S., F.G.S.,
Cambridge.

It is well known that numerous dykes of mica-lamprophyre occur in Westmorland and on the western border of Yorkshire, and they have often received attention from petrologists. The examples to be noticed have not, I think, been described or recorded, although they illustrate certain points of general interest.

The locality is in the upper part of Long Sleddale, S.W. of Buckbarrow Crag. Here four parallel dykes cross the River Sprint near a sheep-fold. The country-rock consists of cleaved andesitic lavas, belonging to the Ordovician volcanic series, and the dykes cut obliquely across the cleavage. Their bearing is about E.N.E., which is directly towards the Shap granite, four miles distant. There are good reasons for believing* that the whole assemblage of dykes in the district is closely related to this granite intrusion, about which the dykes are disposed radially. The widths of our four dykes, in order from S. to N., are about 10ft., 1½ ft., 7 ft., and 8 ft., and it is the first and last of these which are most worth examining.

The most southerly dyke is largely of a type which is unusual in this connection, a fine-grained bluish basaltic-looking rock of specific gravity 2.745. A thin slice shows that it is microporphyritic, with little crystals of felspar and augite in a fine-textured ground, but the whole is too much decomposed to allow of any precise diagnosis. Part of the same dyke, however, is at once recognized as a lamprophyre with abundant flakes of dark mica. Its specific gravity is 2.732. In a thin slice it is seen to be of the kersantite type, the felspar being labradorite. There are numerous shapes of olivine crystals, now replaced by carbonates, but otherwise the rock is unusually fresh. There is a third rock which enters into the constitution of this dyke, viz., a quartz-felsite (sp. gr. 2.581). This is found in the form of enclosed pieces, and its occurrence in this association is significant. At various other places in the district dykes of quartz-felsite and mica-lamprophyre are found together in such circumstances as to suggest a close genetic relationship, and there is evidence that the acid intrusion is somewhat the earlier of the two. In the present case the association is even closer, for it appears that the two rocks were intruded successively in the same dyke-fissure.

The most northerly dyke is of mica-lamprophyre, and contains similar inclusions of quartz-porphyry. A specimen of the dominant type gives the specific gravity 2.712. A series

* *Geol. Mag.* 1892, pp. 199-206.

of thin slices shows several interesting features. There is rather more mica than in the former dyke, and the felspar is oligoclase instead of labradorite, while pseudomorphs after olivine are uncommon. The rock encloses abundant grains of quartz, always showing signs of corrosion. These might conceivably be derived from the breaking up of the lumps of quartz-felsite which are seen in the dyke; but this is not a probable explanation, for in no case is any of the felsitic ground-mass seen adhering to the quartz. Corroded quartz-grains are indeed common in the lamprophyre dykes throughout the district, even where there is no quartz-porphyry, either as enclosed patches or as separate intrusions; and we must infer that they became involved in the lamprophyre magma while this was still in the subterranean reservoir from which it has been drawn.*

A more unusual peculiarity of this lamprophyre dyke is the occurrence of very numerous little spherical structures, about $\frac{1}{20}$ inch in diameter, which have evidently been steam-vesicles, but are now filled in various ways. Some of them are occupied by the ordinary secondary products of the rock—calcite or quartz, or both minerals within the same cavity. Many of the vesicles, however, are filled with a fine-textured felspathic aggregate, which has certainly crystallized from fusion. There is usually a border of biotite-flakes arranged tangentially about the vesicle, and occasionally a flake projects into the interior, or a felspar crystal may be found in a like position. But the material within the vesicle proper is wholly felspathic, and is of much finer texture than the body of the rock, showing either a 'felsitic' texture or a confused aggregate of delicate divergent fibres. The interpretation of this is clear. At a late stage of crystallation, when almost the whole of the rock had solidified, the residual magma, which was wholly felspathic in composition, broke its way into the vesicles, displacing the steam, and there consolidated. In some places it has not entirely filled the cavity, and there remained a crescentic space subsequently occupied by calcite or quartz of secondary origin.

This oozing-in of the final residual magma into steam-cavities is very common in Tertiary andesitic dykes in the West of Scotland and elsewhere, and was first noticed by Dr. Teall in the Tynemouth dyke†, but it is not, so far as I am aware, a usual feature in our lamprophyre dykes. The process which it illustrates is of interest in relation to the origin of various igneous rocks by differentiation. If the residual juice had been by any means squeezed out and injected as a separate intrusion it would have given rise to a rock very different from the lamprophyre with which it was so intimately connected.

* *Geol. Mag.* 1892, pp. 485-488.

† *Geol. Mag.* 1889, pp. 481-483, with plate XIV.

CHEMICAL CONSTITUENTS OF 'MOORLOG.'*

T. LENTON ELLIOTT.

This substance is a Peat Deposit, dredged from the Dogger Bank. It is blackish-brown in colour, similar to old moorland peat, but rather denser and more pulverulent than that variety. The sample was easily reduced to a coarse powder in a mortar.

Solubility:—14.4 per cent. of the powdered sample was soluble in hot water, and the solution gave a neutral re-action, showing absence of 'humic acids.' The matter dissolved was chiefly non-nitrogenous organic matter; more than one-fifth of the matter dissolved was sodium chloride (common salt) and the solution gave reactions for Iron, Alumina, Calcium (Lime), and Sulphates.

This examination is by no means exhaustive, but serves to demonstrate the general composition of the substance.

The percentage of ash (residue after ignition at high temperature), of ordinary 'peats' varies from one per cent. to forty per cent.

Carbonic acid is never found in any quantity in peat-ash, on account of the high temperature necessary to completely burn it; it is driven off when present.

The neutral re-action of the aqueous extract shows the absence of alkaline carbonates.

The percentage of Lime (CaO) i generally about double the amount of the oxide of iron ($Fe_2 O_3$) in ordinary peats. In the present report, this usual relationship is disturbed, the iron-oxide being about four times the quantity of the lime.

German moor peat has always a higher percentage of ash than Irish bog peat, and while the present figures are unlike any recorded analyses at my disposal, they bear some slight relationship to German moorland deposits. Generally speaking, the German deposits are of an older formation than the Irish.

General Analysis

	Per Cent.
Moisture (lost at 100°-110° Cent)	22.0
†Ash (Mineral Matter)	24.8
Sodium Chloride (calculated from total Cl)	4.1
†Organic Matter (by difference)	49.1
	100.0

* See J. W. Stather in *The Naturalist* for May, p. 138.

† Contains Nitrogen—14·0 per cent. (not confirmed).

*Composition of the Ash.	Per Cent.
Silica (insoluble sand)	2·4
Oxide of Iron (Fe_2O_3)	8.2
Alumina (Al_2O_3)	2.1
Lime (CaO)	2.3
Magnesia (MgO)	1.1
Sulphuric Acid (combined SO_3)	5.8
*Unestimated	2.9
	24·8

The analyses were carried to two places of decimals, but as such detail is of little value except in critical determinations, I have shown only the nearest figure in the first decimal place.

The total Chlorine, calculated to Sodium Chloride, is shown in the general analysis, because practically the whole of this was volatilized at the temperature of ignition, preparatory to examining the ash.

The siliceous matter has the character of sand, and shows no evidence of diatomaceous structure on microscopic examination.

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The sixty-third report of the museum, etc., at **Ipswich** has been received, and contains details of many valuable additions, including several purchased by the Felix Cobbold bequest. Mr. J. R. Moir has assisted in the re-arrangement of the prehistoric implements. The Curator gives a list of the collections which are packed away, awaiting the provision of proper exhibition cases. During the year an appeal was made for £100 to purchase a collection of heads of African Big Game, and the amount was collected in ten days.

The annual report of the **Perthshire** Natural History Museum includes details of the work accomplished during the year, as well as a list of the additions. These are arranged under the heads of Mammals, Birds, Fishes, Invertebrates, Botany, Geology, and Lantern Slides. There is also the usual meteorological report, carefully compiled by the Curator, Mr. Rodger. Among the botanical specimens, we are not quite sure whether 'Lizzie' is the name of an oak tree, like the 'female leech' in the play, or whether it is a name cut on the bark.

The **Guide to the Museum of Fisheries and Shipping, Hull,** has just been published. The guide, which is the 87th publication issued by the Museums, has been written by Mr. Sheppard, and contains an interesting introduction to the collection, with special reference to the objects relating to the whaling days. Then follow particulars of the five hundred and eighty-nine exhibits in the collection, the number of which is increasing almost daily. They include specimens ranging in size from small marine organisms preserved in spirits, to models of fishing appliances, several feet in length, Esquimaux canoes, and skeletons of whales. Though the collection has been on view a very short time, the building seems to contain quite as much as it can comfortably hold, while on occasions such as Bank Holidays and Sundays, there is hardly accommodation for the crowds that visit it. The Guide is well illustrated by photographs and sketches, contains 48 pages, and is sold at one penny.

* Alkali metals, *traces* of Phosphoric Acid, Chlorine, Carbonic Acid.

THE EVOLUTION OF BRIDLINGTON.*

T. SHEPPARD, F.G.S.
(*President : Geological Section, Y.N.U.*).

As we view th grand promontory—Flamborough Head—from Bridlington ; or, better still, as we see it from the water, and as we admire the magnificent wall of white rock at Speeton, towering above us to a height of over 440 feet, we naturally feel convinced that such a feature was surely there since the earth was made. Centuries of wearing and battering by the waves and storms seem to have made no appreciable impression. If ever there were everlasting hills, surely they were here. Flamborough Headland, one would think, has endured and will endure all time. Yet no greater mistake could be made. Here, in this part of our glorious county, as elsewhere, it can safely be said that

> " The hills are shadows, and they flow
> From form to form ; and nothing stands.
> They melt like mists, the solid lands
> Like clouds they shape themselves, and go."

And, as we can see later, just as these seemingly solid cliffs are wearing and crumbling away, so, too, were they not always there. As a matter of fact, they form but quite a recent chapter in the earth's history. Myriads of years had passed before the Flamborough cliffs, or the beds of chalk of which they are composed, were ever formed Thousands upon thousands of feet of solid rock occur upon the earth's surface, entombed in which are the remains of plants, shells, insects, large reptiles, fishes innumerable, and even mammals. All these had lived and died, and were buried, countless ages before a single particle of the chalk forming Flamborough Head came to be. These old rocks and their contents clearly show to what a variety of changes the surface of the globe had been subjected—old land areas with tropical forests ; warm seas with coral reefs ; shallow shores ; deep oceanic oozes ; rivers and estuaries ; had all existed and left their indelible impressions preserved in the rocks.

Then, and not till then, upon a rocky floor in the bed of an extensive and deep ocean, the first chapter in the history of Bridlington began to be written. All this, as has been pointed out, at a late period in the earth's history. And though, at Bridlington, we can trace what took place aeons before man ever appeared on the earth at all, still we must look upon ourselves as representing merely the final chapters in a great history.

* Read at the Bridlington meeting of the Yorkshire Naturalists' Union.

Let us for a while take our minds back to that far-off time, a time impossible to measure by mere years, when the land we now live upon was not existing. When all this part of the world was deep down beneath the waters of a great sea, the extent of which can be defined to-day with fair accuracy. This sea was then as the sea is now, crowded with a profusion of animal and plant life. Fishes innumerable from quite small ones to large sharks, fed upon the other organisms in the water, and upon each other. Cuttle-fishes with their many tentacles, and their ink bags for darkening the waters when pursued by enemies, abounded. Shells innumerable—bivalves and univalves, were living too ; and frequently reached far greater proportions than any shells living in the British seas to-day. The sea floor was covered with sponges, and other lower organisms. And the water itself from top to bottom was crowded with minute specks of life, so small that a powerful microscope is necessary to make out their structure ; just as the seas are crowded with similar organisms to-day. They are called foraminifera. Yet it is to these, the smallest and humblest of them all, that we owe the very foundations of the town of Bridlington. As these died, their calcareous skeletons, or shells, slowly found their way to the bottom of the water, and accumulated in a soft, chalky ooze, just such an ooze was found on the bottom of our present oceans by the researches of the officers of the "Challenger" expedition. Possibly it took very many years, quite likely a century, for a layer of even an inch in depth to accumulate. Yet slowly and surely the deposits grew in thickness, as century after century passed away. And to add to this formation, though only to a slight degree, the remains of the fishes, the squids, the shells, and the sponges were left on the ocean bed, to be gradually entombed by the constantly falling ooze. All this took place before man trod this earth. Yet almost every chapter, every page of this part of our earth's history, can easily be deciphered.

Then, for some cause unknown, one of those great changes in the earth's surface, of which we have unquestionable evidence of so many, took place. This great cretaceous sea floor gradually arose, the waters of the ocean were displaced, and slowly the sea-bed not only became dry land, but was lifted up several hundred feet above the water level. Partly by pressure of the great mass, partly by changes wrought by infiltrating water, and for other reasons, the soft ooze was converted into a hard limestone, certainly well over a thousand feet in thickness. Mr. G. W. Lamplugh, by careful surveys, has estimated that in Yorkshire alone, there are to-day over 1,250 feet of solid chalk—in other parts there are greater thicknesses—certainly a considerable amount has been worn away from the surface of Yorkshire since it became dry land.

As we stand at the foot of the Speeton cliffs to-day, and gaze skyward at the 450 feet of towering chalk above us, remembering that it also extends some distance beneath our feet, does it not fill us with wonder at the way the world was made. When we recollect that a single inch layer probably represents the accumulation of over a century, it is appaling to think of the enormous amount of time that is represented in these grand cliffs. It is also worth remembering that practically all this rock is formed of the skeletons of myriads of microscopic organisms. Bearing this in mind, let anyone who is at all concerned with his own importance, try to imagine what impression he will have made upon this earth's surface, say ten thousand years hence ! He will probably not by then have left behind so much as one of these small foraminifera, and by then the foraminifera will, in all probability, be still in evidence.

Let us digress a little, and examine the chalk itself. A small fragment, prepared and placed under a microscope, will, as stated, be found to consist almost entirely of the skeletons of the small foraminifera. Even now, after all these years, their exceedingly delicate shells are still preserved, and, in fact, seem quite unchanged ; so much so, that it is possible to separate and classify and name the various forms, just as to-day we can distinguish an oyster from a periwinkle or a mussel. When we come to compare this fossil ooze with the ooze from the beds of modern oceans, it will be seen that the similiarity is simply marvellous. To view the two together will leave no doubt in the mind of any person that they must have had a similar origin.

Then, too, in the quarries or in the cliff face, will be found the oyster-like shells, the sea-urchins, the cuttle fish bones, the great nautilus-like shells, the sponges, the corals and even the teeth and bones of sharks, all clearly and indisputably telling the story of their origin, and of the way in which the chalk was formed.

Let us for a moment get back to the land. Soon after the great upheaval of the ocean floor, the rains and winds, the snows and frosts would start their work, and carve what was probably at first a fairly level surface, into hills and hollows, valleys and dales. This would seem inevitable. Lakes and streams and rivers would be formed, and the old sea bed would soon present a surface, perhaps, not so very much unlike that of the wolds to-day. Where a bed of flint, or an extra hard bed of chalk rock occured, the river channels would be diverted and changed. Possibly, also, in the process of upheaval, cracks and fissures would be made, such as, indeed, we still can see. Or, as at " Old Dor," great crumplings and foldings would be formed in the strata. All these would effect the

drainage. As time went on, the small streams would join together and form larger ones, and eventually a great series of rivers and tributaries would exist.

As a matter of fact, there is ample evidence that there once was such a system. A great river formerly flowed northward along the middle of what was once known as the German Ocean, but is now better described at the North Sea—the Thames, the Humber, the Tees, and other of our great English rivers, were then merely its tributaries. As time went on, however, the sea came to its own again, and its waters once more began to wash away the very beds of chalk that it had formed so many millions of years before. And so we find that a cliff-line was formed on the eastern side of our island, and slowly this receded westward as the water washed it away. By borings, and by aid of quarries, this old cliff line can still be traced. It stills exists, though buried. It takes an inland course at Sewerby, just north of Bridlington, and extends through Driffield, Beverley and Cottingham, to the Humber estuary at Hessle. The Humber—a mighty river even in this far-off time, had cut its way through the chalk to the sea; its old bed can yet be traced. And at other places, as at Danes' Dyke Ravine, and at North and South Landings, on the Headland, earlier streams had cut their way through the hard rock to the sea level, their old beds, though blocked by later deposits, still being visible in the cliffs.

Such, then, is the story of the "foundation" of Bridlington.

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British Birds for August contains a description and illustration of 'The Terek Sandpiper: a new British Bird' taken in Kent, and duly seen 'in the flesh.'

A report of the public lecture given at Dublin in connection with the Museums Association by Dr. Hoyle, on the subject of 'Museums: Interesting and Otherwise,' appears in *The Museums Journal* for July.

In the *New Phytologist* for July, there is an important paper on 'Floral Evolution, with particular reference to the Sympetalous Dicotyledons,' by H. F. Wernham, and F. Cavers writes on recent work on the Bryophyta.

In the *Geological Magazine* for August Mr. Jukes-Browne concludes his paper on the 'Recognition of Two Stages in the Upper Chalk,' and gives valuable lists of Inocerami and echinoderms; the latter includes Dr. Rowe's records, 'so that the list is more correct than any that has previously been published.'

The *New Phytologist* before us contains a paper on 'Floral Evolution,' by H. F. Wernham, one on 'Sir Joseph Hooker, and Charles Darwin, the History of a Forty Years' Friendship,' by A. C. Seward; 'Modern Systems of Classification of the Angiosperms,' by C. E. Moss, and 'Meiosis and Alternation of Generations,' by A. G. Tansley. By the way, we notice the part is described as 'Double Number, Vol. XI., Nos. 5 and 6, May and June 1912, published June 24th'. Why the absurdity of the two numbers, and two parts, and the necessity for the words 'Double Number'?

YORKSHIRE NATURALISTS AT TEBAY.

It is seldom that the members of the Union go outside their own county for the purpose of an excursion, but in fixing upon Lowgill, situate practically in the centre of the Tebay gorge, it was necessary that some place more accessible should be selected, where facilities for making investigations could be more readily accomplished, hence the decision to make Tebay, 'the land of the mountain and the flood,' the centre from which to work. The successful nature of the gathering proved the wisdom of Mr. W. Robinson's choice, and the numerous members who assembled for the August Bank Holiday week-end were well rewarded for their persistent efforts under, at times, most inclement conditions. During the very brief periods when sunshine favoured the glorious vista of those everlasting hills, especially the Howgill Fe ls, and their green clad intersecting valleys, will always be a pleasant memory; but when clouds veiled the scene and shed their watery contents with such persistency, what wonder that even the ardent student of nature grumbled, just a little, at anticipated pleasure spoilt!

The headquarters were the Cross Keys Hotel, and its accommodation was sorely taxed by the large number of members who put in an appearance, thirteen Societies being represented; but the genial landlady surmounted all difficulties, and made provision for the many who had to seek nightly repose elsewhere. All were bent on work, and as most sections were represented, it was not difficult to find sectional recorders for each department, and as Tebay was new ground, particular notes on the fauna and flora were made.

On Saturday the general body of naturalists kept to the Yorkshire side, training to Sedbergh, and on arrival there driving to Cautley, and, after spending an enjoyable day on Cautley Fells, and viewing the celebrated waterfall, returned to Tebay. Under the guidance of Mr. Robinson, the geologists worked the various gills between Tebay and Ravenstonedale, returning by train from the latter place.

The surroundings of the villages of Orton, Raisbeck and Newbiggin also received attention, and yielded many interesting plants, and plant associations. The members also availed themselves of the kind invitation of Mr. H. Goodwin, and visited the charming grounds of Orton Hall, and inspected the fine rock garden.

There are humourists at Orton, for decorating the garden walls adjacent to two dwelling-houses are slabs of curiously-weathered limestone, which, in some cases, by a little artificial aid, portray prehistoric mammalian forms, and, in addition to unique birds, the word 'Kendal' is well indicated.

Monday saw the majority journeying by an early train to Shap, under the guidance of Mr. J. Oliver. The threatened rain came down long before the first of the quarries worked by the Shap Granite Co., was reached, and, after a thorough examination of the geological features, a small number proceeded by the tram track to the celebrated Shap Granite quarry.

The archæological remains in the district also received attention, a portion of those who took part in Monday's excursion visiting the ruins of Shap Abbey, while the excellent evidences of Roman occupation quite near to Tebay, the 'Druidical' Circle outside the village of Orton, and the ancient church at the same place, amply repaid those who visited them.

The general meeting was held under the presidency of Mr. J. W. Taylor. Excellent reports on the work accomplished during the excursions were given by Messrs W. Robinson, E. Hawkesworth, T. W. Woodhead, Rosse Butterfield, Fred Haxby, H. B. Booth, T. Stringer, W. P. Winter and the Chairman. A hearty vote of thanks was accorded to Mr. H. Goodwin, for permission to visit his estates and gardens; to the Shap Granite Co., for permission to visit their quarries; and to Mr. W. Robinson for the admirable and efficient manner in which he made the local arrangements. Mr. Robinson suitably acknowledged, and moved that the thanks of the Union be accorded to Mr. Taylor, for the interest he had taken in the various excursions of the Union during his term of office as President. The resolution was carried unanimously.

Geology.—Mr. Edwin Hawkesworth writes:—Silurian, Old Red Sandstone (?), Basement Carboniferous, Carboniferous Limestone, Shap Granite, added to glacial and physical features of the greatest possible interest, provided an unusually attractive 'bill of fare' for the geologists. The party had the great advantage of the guidance and local knowledge of Messrs. W. Robinson and J. Oliver, of Sedbergh. Its work was very much hindered by the bad weather, the gills being so full of water that many of the sections which should have been examined, were quite inaccessible. Saturday was spent in studying the conglomerates, with their associated shales and sandstones, which are deposited upon the upturned edges of the Silurian rocks; forming the Basement Beds of the Carboniferous system. Most of the gills flowing northwards into the Lune, between Tebay and Kirkby Stephen, cut through these beds, which are extremely variable. No junction between these and the older rocks is visible in the most westerly gills, but in Langdale red conglomerates and sandstones were seen resting on highly inclined slates. It is interesting to note that many quartz pebbles, some of large size, were found in the former. Proceeding eastwards, the red conglomerate appeared to be

absent ; in Flakebridge and at Scar Sikes, the Lower Limestone Shales series, consisting of shales, calcareous sandstones and impure limestones, were seen laid upon the Silurian slates. Pinsky Gill, near Newbiggin, was the main objective of the day's excursion. The Lower Carboniferous rocks exposed here have yielded a somewhat remarkable suite of fossils, but, owing to rain coming on, and to the swollen state of the beck, it was impossible to trace out the beds.

It had been hoped that during the excursion, evidence might be obtained as to the relationship between the Red Conglomerates, containing pebbles of very many kinds of rocks, resting upon the Silurian, and the overlying Green Conglomerates, whose contents are mostly quartz pebbles. In Penny Farm Gill, near Sedbergh, there is an unconformity between these, and if such can be found in other areas, it will go a long way towards proving that these red rocks are of Old Red Sandstone age, an opinion which is now held by some eminent geologists. Unfortunately, bad weather prevented an examination of the one or two localities where both the conglomerates are exposed in super-position.

Monday was devoted to a visit to the parent mass of the Shap Granite. All Yorkshire naturalists are familiar with the ice-carried boulders of this remarkable rock, scattered over the county, so it was not to be wondered at that almost all present at the meeting started out betimes to see its source of origin. But, alas! only a minority arrived at the granite quarry. The morning was exceedingly wet, and, by the time the lower quarry was reached, many of the members were ready to turn back. This quarry is in the Coniston Limestone (Bala Beds), which is very much altered by its proximity to the granite. In one or two parts of the section interesting minerals, such as garnets, idocrase, and pyrites, were found. Those of the party who went ahead to the granite quarry, up Wastdale Crag, by way of the railway track, will not readily forget the experience—the rain coming down in torrents, and the wind blowing with hurricane force. There was a gradual reduction of numbers, and when the survivors reached the quarry, there did not seem any well-marked disposition to examine the sections at close quarters. Some time was spent in a shed, draining the water off coats, emptying it out of boots, wringing it out of stockings, and waiting for the storm to abate. One prominent member of the Union expressed the opinion that he had always looked upon the geologists' ' job ' as a gentleman's one, what has to be seen always being there, only needing the selection of a fine day and a comfortable journey ; but this walk had completely altered his views. The weather not improving, a hurried glance was made at the section, a few specimens obtained, and the hill was descended to Shap. Later in the day, a brief

inspection was made of some of the sections exposed in the Blea Beck, showing altered Ordovician beds with igneous dykes. It had been intended to make a careful examination of these, and the junction of the granite with the Ordovician rocks in Sherry Gill, but the prevailing conditions made almost a complete failure of what should have been a memorable day's geology.

VERTEBRATE ZOOLOGY.—Mr. H. B. Booth, M.B.O.U., writes :—This was scarcely the time of the year for the ornithologist to expect much in this district—his time here would be in the early spring, when the rapacious birds were nesting. In the Yorkshire portion of the area visited the only species worth noting were the sight of a Raven, a brood of Ring Ouzels, and an enormously large Toad, which, apart from its size, is an animal that is but sparsely represented in the more western parts of the West Riding.

Of the vertebrate animals seen in the Westmorland portion of this excursion, those chiefly of interest were :—*Mammals*—Hedgehog, Rabbit, Fox ; and the trappings for small mammals in the immediate neighbourhood of Tebay, only yielded the Common Shrew in abundance. The birds of the neighbourhood were chiefly of the moorland species, viz., Lapwing, Golden Plover, Snipe, Curlew, Redshank, Carrion Crow, Wheatear, Whinchat, with the Meadow Pipit as the prevailing species. A pair of Corn Buntings near to the village of Raisbeck was worthy of note, owing to the sparsity of this species around this district. The Red Grouse was the only game-bird, and the Sparrow Hawk the only bird of prey seen. Other species noted were the Common Sandpiper, Grey Wagtail, Black-headed Gull and Heron.* Species which only occurred very sparingly, and which might have been expected in greater numbers included the Skylark, Yellow Hammer, House and Sand Martins, Common Whitethroat, and Redstart. In reptiles the Frog was abundant all over the district. In Pisces, several anglers who were staying at the hotel, brought in many Trout, three Eels, and a few young Salmon, from the upper reaches of the Lune at Tebay, and reported that Salmon or Sea-Trout were abundant there.

The most interesting ornithological item was the fairly large Starling ' roost ' in the vicarage grounds, and immediately adjoining the Cross Keys Hotel, where the birds kept up a continual chatter until well into the night. The Starling is not by any means an abundant bird in this district, and the ' roost ' appeared to be resorted to from every point of the compass around ; as was proved by watching the birds coming in (in

* We were informed on very credible authority that a single pair of Herons nested at Killeth, near Gaisgill in 1911, when young were hatched ; but these were killed by boys. The old pair did not return in 1912.

small flocks) in the evenings. On enquiries, we were informed that these Starlings gathered there each season from the beginning of June (a proof that the majority—if not all—the Starlings of the district were single-brooded) and despite all efforts to drive them away, they would not leave until the leaves of the trees fell (the trees were chiefly Horse Chestnuts and Sycamore), which may be, or may not be proof that these Starlings were migratory. This yet remains to be proved for this area; as they may possibly only shift their 'roost' with the fall of the leaves; but this did not appear to be known locally.

Lepidoptera.—Mr. T. Stringer reports that the only species observed were:—*Coenonymph pamphilus, Pieris brassicæ, P. rapae, Vanessa urticæ, V. cardui, Lycaena alexis,* larva of *Bombyx quercus* var. *callunæ.*

Isopoda.—Only two species, viz.:—*Oniscus asellus* and *Porcellio scaber.*

Conchology.—Mr. J. W. Taylor writes:—Owing to its submontane character, the district investigated about Tebay is not so favourable for the conchologist; but thanks to the diligent and persistent efforts of Mr. Stringer and Mr. Greaves, and the very effective and welcome help of Mr. Winter, no fewer than ten additional species were added to the known molluscan fauna of the neighbourhood. Of these, only one species, *Euconulus fulvus,* found by Mr. Winter, is a Yorkshire capture; the remainder, *Arion hortensis, Limax arborum, Pupa umbilicata* and *Vertigo edentula* amongst the land shells, as well as *Limnæa peregra, Limnæa truncatula, Ancylus fluviatilis, Pisidium fontinale* and *Pisidium milium* among the freshwater species were all found within the Westmorland border.—W.E.L.W.

NOTES ON THE BOTANY OF CAUTLEY AND TEBAY.

T. W. WOODHEAD, Ph.D., F.L.S.

During the Yorkshire Naturalists' Union excursion to Tebay, August 3rd-5th, 1912, the energies of the botanists were about equally divided between the counties of Yorkshire and Westmorland. Saturday, August 3rd, was spent on the Yorkshire side in the neighbourhood of Cautley Spout and the eastern slope of Howgill Fell. A study was made of the vegetation of the bright green flushes of the fell sides, the intervening drier grey-green ridges, the gorge at Cautley Spout, the screes on the steep slopes and the higher ground of the peat-covered Fell.

The numerous flushes of the Fell sides are carpeted with a bright green vegetation, and here and there are boggy hollows

with sphagna, *Polytrichum commune, P. juniperum, Dicranella squarrosa* and *Aulacomium palustre*. The characteristic flowering plants are Vernal Grass (*Anthoxanthum odoratum*), Flea Sedge (*Carex pulicaris*), Yellow Sedge (*C. flava*), Glaucous Sedge (*C. glauca*), Soft Rush (*Juncus effusus*) and *J. conglomeratus*, Bog Asphodel (*Narthecium ossifragum*), Lesser Spearwort (*R. flammula*), Buttercup (*R. acris*), Marsh Violet (*V. palustris*), Wood Sorrel (*Oxalis acetosella*), Tormentil (*Potentilla erecta*), Bird's foot Trefoil (*Lotus corniculatus*), White Clover (*Trifolium repens*), Marsh Pennywort (*Hydrocotyle vulgaris*), Ribwort (*Plantago lanceolata*), Self-heal (*Prunella vulgaris*), Forget-me-not (*Myosotis palustris*), Eyebright (*Euphrasia officinalis*), Lousewort (*Pedicularis sylvatica*), Sundew (*Drosera rotundifolia*), Grass of Parnassus (*Parnassia palustris*), Butterwort (*Pinguicula vulgaris*), Daisy (*Bellis perennis*), and the Thistles (*Cirsum palustre* and the white variety *ferox*). In the higher parts occurred the Alpine Lady's Mantle (*Alchemilla alpina*), Scurvy Grass (*Cochlearia alpina*), Marsh Willow-herb (*Epilobium palustre*), Alpine Bistort (*Polygonum viviparum*), and the Club Mosses (*Lycopoduim alpinum, L. clavatum, L. selago*, and *Selaginella selaginoides*). The drier ridges between the flushes are covered with a grey-green sward of wiry grasses; the chief species here are the Sheep's Fescue grass (*Festuca ovina*), Tufted Hair-grass (*Deschampsia cæspitosa*) and Mat-grass (*Nardus stricta*); subordinate species are Vernal grass, Yorkshire Fog (*Holcus lanatus*), Eyebright, Lady's Bedstraw (*Galium saxtile*), White Clover, Tormentil, dwarf Ling and Bilberry, Milkwort, Thyme (*Thymus serpyllum*), Sheep's Sorrel (*Rumex acetosella*), Heath Rush (*Juncus squarrosus*), and on the higher slopes the Crowberry (*Empetrum nigrum*). The bracken covers much of the lower slopes.

Ascending the Fell above the waterfall the ground is covered by a bed of peat 12 inches to 18 inches thick, and here the vegetation forms a vaccinium edge; the Bilberry is short but dominant, and associated with it are Ling, Cross-leaved Heath, Cowberry (*V. Vitis-idæa*), Mat-grass and Hair-grass; the Crowberry is common, and also the Heath Rush. Higher still on the ill-drained ground Cotton grasses (*Eriophorum vaginatum* and *E. angustifolium*) predominate.

In a hollow bared of peat and much manured by sheep, was noted a bright green carpet of Vernal grass and Bent grass, together with a luxuriant form of Lady's bedstraw. The hollow was obviously used for shelter by the sheep and furnished an interesting example of a 'lair flora.'

The screes near Cautley Spout provided a good illustration of plant invasion and migratory association. The larger stones of the scree are covered with lichens, the most frequent being *Lecidia geographica, L. prasiana, Cladonia sylvatica* and

C. fimbriata, and padding large spaces between the stones were dead clumps of the moss, *Rhacomitrium canescens*; these were the early invaders, and contributed a soil which accummulated between the damp stones below. Growing in the shelter of hollows and behind banks of stones, the Parsley fern (*Crypto-*

Photo by] [*J. Bradley.*

Parsley Fern on the Screes at Cautley Crag.

gramme crispa) flourished luxuriantly, and was the most conspicuous of the vascular plants. Other rhizomatous scree-binders were Bilberry, Limestone Polypody, and Bracken, the dead fronds and rhizomes of the latter being abundant among the stones. On the masses of parsley fern and growing in the humus which it forms were Vernal grass, Hair grass, Bent grass, Lady's Bedstraw, round-leaved Bellflower (*Campanula rotundifolia*) and Foxglove (*Digitalis purpurea*). Invading the edges were the Soft grass (*H. mollis*), Bilberry and Bracken.

As the vegetation develops, and the scree becomes covered except for numerous small stones on the surface, the parsley fern becomes less abundant, and give place to a more stable association of wiry grasses and heath associates. In addition to the above-mentioned species were Sheep's Fescue grass, Mat grass, Tormentil, Ling, and Club moss (*L. clavatum*).

In the gorge at Cautley Spout, Ling, Cross-leaved Heath and Golden Rod occurred in large showy masses hanging on the rocky ledges, also shrubby specimens of Mountain Ash, Hawthorn, and Common Ash. Here ferns were abundant, *e.g.*, Male Fern (*D. Filix-mas*), Mountain Fern (*D. montana*), Lady Fern (*A. Filix-fœmina*) and the Spleenworts (*Asplenium Trichomanes, A. viride* and *A. Adiantum-nigrum*).

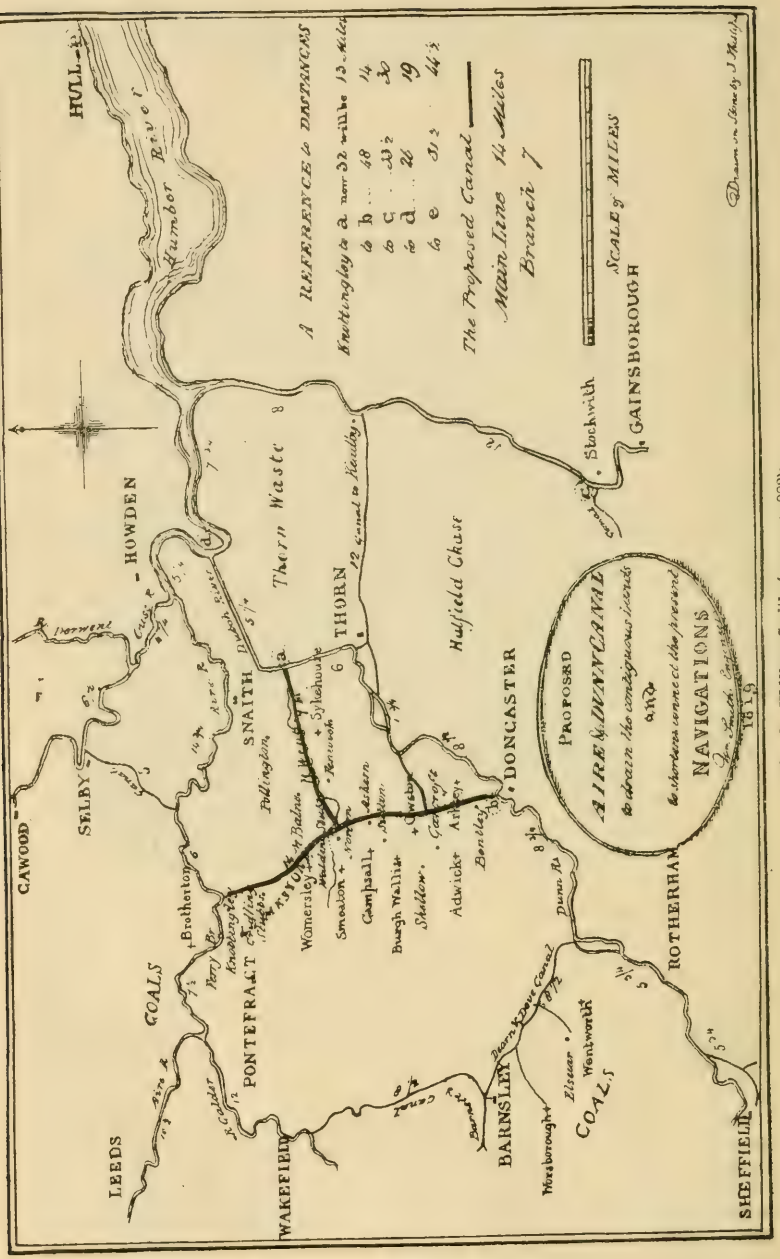
The most interesting feature on the Westmorland side was the extensive development of Sphagnum bogs at the Howes, Gamelands, and, to a much smaller extent, on parts of the Calluna heath of Low Moor.

The bog at the Howes was carefully examined, and was found to be developed on Boulder Clay resting on the Lower Carboniferous shales. The dominant plant is the bog-moss (*Sphagnum cymbifolium*). Other common mosses are *Aulocomium palustre, Polytrichum commune* and *P. juniperum*. Rushes and Sedges are abundant, the chief being *Juncus articulatus, J. conglomeratus, J. effusus, J. bulbosus*, and *J. squarrosus, Carex panicea, C. vulgaris, C. pulicaris, C. fulva* and *C. flava*. The marsh club rush (*Eleocharis palustris*) is abundant, and in smaller quantity the cotton grasses (*E. vaginatum* and *E. angustifolium*). The chief grasses are *Mollinia cærulea, Nardus stricta* and *Agrostis tenuis*. The Bog Asphodel (*Narthecium ossifragum*) is very abundant and was undoubtedly the most showy plant seen on the excursion. Other common species are Ling, Cross-leaved Heath, Round-leaved Sundew, Common Butterwort, Marsh Lousewort (*Pedicularis palustris*), Marsh Bedstraw (*Galium palustre*), Tormentil and the lichens *Cladonia rangiferina* and *C. sylvatica*.

At Gamelands, and also at Low Moor the Bogbean (*Menyanthes trifoliata*) is plentiful, and on the roadside a single specimen of the Marsh Gentian (*G. pneumonanthe*) was found. In a small sphagnum bog on the grassy fells in the neighbourhood of the Shap Granite quarry the Sweet Gale (*Myrica gale*) occurs in abundance.

In Volume IX., Part 2 of the Annals of the South African Museum, recently published, Dr. G. S. West has an illustrated account of the Algæ of South Africa, in which several new species are described.

As Supplement to No. 9 of its Journal, the Board of Agriculture has recently issued 'Notes on Kerry Woods, Illustrating Methods of Collecting and Utilising Information for a Forest Survey.' The pamphlet is exceptionally well illustrated, and sold at 4d.



Plan by William Smith (see page 283):

Naturalist,

A YORKSHIRE PLAN BY WILLIAM SMITH.

ANY record of the work of William Smith, the 'father of English Geology,' is so very important, and year by year is becoming more and more difficult to trace that it is essential we should as far as possible make careful note of anything of his that turns up.

Among a collection of Yorkshire maps which I recently purchased, is a lithographed copy of a map of South Yorkshire which does not appear to be referred to by John Phillips, Smith's nephew and biographer, in the scarce 'memoirs of William Smith,' published in 1844, nor is it referred to by Woodward, Judd, or other more recent writers. The lithograph, which is reproduced herewith (page 282), is described as 'Proposed Aire and Dunn Canal to drain the contiguous lands and to shorten and connect the present navigations.—Wm. Smith, 1819.' In the bottom right hand corner is a note to the effect that the map was 'drawn on stone by J. Phillips.' The year 1819 is that in which the greatest proportion of Smith's maps were published, and presumably this map was issued in connection with a prospectus, as it is fooslcap size, folded in four, and has on the back of one of the folds 'Aire and Dun (sic) Junction Canal and Extensive Drainage in Yorks. Printed by E. William's, 11, Strand.'—T. SHEPPARD, Hull.

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***Trientalis europea* L. at Bradshaw, Yorkshire.**—Midsummer this year, Dr. Woodhead and I visited Soil Hill, Bradshaw, where we found *Trientalis europea* L. in plenty and flowering freely, and I am happy to say showing no signs of becoming extinct. The late J. Bolton (1775) records it as occurring 'on a moor in Bradshaw, about the pipe-clay pits,' this station is identical with the one we visited. I think I am correct in stating that this is the most southern station for this plant in Britain. We noticed one feature which is perhaps worthy of a record. On a sloping piece of ground the *Trientalis* was found growing plentifully among *Nardus stricta* and *Vaccinium Myrtillus*. On a careful examination of the underground parts, it was distinctly noticeable that the *Trientalis* sent down its stem considerably *below* the grass tussock, where it spread out its rhizome at right angles to the stem axis, and the long rootlets descending from the rhizome fed at a *lower level than those of the Nardus stricta*. A similar Complementary society was noticed at Castleton, in Cleveland, where *Trientalis* is abundant and is comparable to that of *Sphagnum*, *Calluna* and *Listera cordata* of our moors. Bolton writes of *L. cordata* as growing at Causeway foot where *Trientalis* grows. I am afraid the former has not been seen there for many years.—W. CASH, Halifax.

FIELD NOTES.

ENTOMOLOGY.

***Ancistronycha abdominalis* F. in Jarrow.**—A fine specimen of this beetle was brought to me on May 24th, having been picked up in a street in Jarrow, near the outskirts. Bold records it in his 'Coleoptera of Northumberland and Durham' (Edition of 1871), without any note as to its frequency; but Fowler says 'confined to hilly and mountainous districts, and always rare.' Its occurrence in a flat industrial town is thus doubly interesting.—GEO. B. WALSH, Jarrow.

BIRDS.

Unusual Situation for a Waterhen's Nest.—I have seen Waterhen's nests in many curious and unlikely places but have never before this year seen one in the middle of a

Waterhen's Nest in middle of a Meadow at Bempton.

meadow. The nest was a considerable distance from the water, close to the village of Bempton. The friend who showed it to me said he was sure the bird must imagine she was a corncrake.* When going to the nest she evidently alighted some short distance from it, and always at one spot, as there was a well-marked 'run' through the grass.—R. FORTUNE.

* The bird was surely anticipating the floods of this 'summer.'

SECOND SUPPLEMENT TO THE FLORA OF DEWSBURY AND DISTRICT.

By the Late P. FOX LEE,

(*Continued from page 244*).

2870b. EQUISETUM LIMOSUM var. FLUVIATILE (Linn.). With the type, about Coxley Dam.

2872. E. HYEMALE L. Near Lascelles Hall, Mirfield, see 'The Flora of West Yorkshire,' p. 522. Mr. Lees adds, 'Not at all unlikely to be re-found on Calder banks, down washed from North Dean or Mirfield. It is tenacious of its sites.'

2896c. DRYOPTERIS FILIX-MAS Schott. var. PALEACEA (Don.) Druce (*Borreri* Newm.). With fine large fronds. Wood near Haigh House, Thornhill Edge; Coxley Wood, Horbury.

The following Alien Species of the district are grouped under headings indicating the various avenues of introduction; wool, cotton, grain, etc., being now imported from many parts of the world.

(1). MISCELLANEOUS—GARDEN STRAYS, RELICS OF CULTIVATION AND GARDEN WEEDS.

60. DELPHINIUM AJACIS L. Waste ground, Mirfield.

90. GLAUCIUM CORNICULATUM Curt. Calder bank, Mirfield. The Seedsmen's 'Horn Poppy.'

277. RAPHANUS SATIVUS L. Calder bank, Mirfield. Garden-seed origin. Native of Eastern Europe.

505. OXALIS CORNICULATA L. Garden stray, Dewsbury.

1130. FOENICULUM VULGARE Mill. Garden escape. Calder bank, Mirfield; abundant in a stone quarry, Horbury.

KAULFUSSIA AMELLOIDES Willd. The merest garden-stray. The 'blue daisy' of florists' catalogues. Wool-waste heap, Batley Carr.

1253. ASTER LAEVIS L. Calder bank, Ravensthorpe.

1290. AMBROSIA MARITIMA L. West Mills, Mirfield. (Messrs. F. Buckley and A. Jessop).

1357. CHRYSANTHEMUM CORONARIUM L. Probably a garden escape. By Malt kiln, Mirfield (Messrs. Buckley and Jessop).

1443. MARIANA LACTEA Hill. Milk-veined Thistle. Garden escape probably, Staincliffe, Dewsbury; Shepley Bridge.

1851. PHYSALIS ALKEKENGI L. Casual. Old corn mill, Ledgard Bridge, Mirfield (Messrs. Buckley and Jessop).

1879. LINARIA CHALEPENSIS Mill. Eastern cornfield plant. Old lime-kilns, Mirfield (Messrs. F. Buckley and A. Jessop).

2137. BETA VULGARIS L. Waste ground in several places. A relic of cultivation.

(2) Weeds of Cultivated Ground and Introductions.

108. Fumária muralis Sonder. As a garden weed, Dewsbury.

461. Hibiscus Trionum L. The Bladder Ketmia. In a bed of strawberries, garden, Mirfield (C. Ely).

916. Acæna Sanguisorbæ Vahl. Spen Valley, woollen mill tips, where Australian fleeces are scoured, and the waste cast down. Seen in 1898, 1902, and after. Often misreported as the next. (F. A. Lees).

917. Poterium Sanguisorba L. Salad Burnet. A rare plant off limestone strata. Only a casual here. Waste ground, Mirfield. (H. Parkinson).

1076. Bryonia dioica Jacq. Red-berried Bryony. Rare in North England, off limestone. Hedge-row, Denby Dale road, bird-brought (W. Rushforth). 'This species is xerophile, avoiding Carb. limestone, and occurs in many places on Triasssic Sand and gravel as far north as Durham, and on Coal Measures in Derbyshire; it may be bird-sown, that being one of its means of distribution, but I believe it to be rather an ancient item of the flora now in a rapid decline.' (F. A. Lees).

1082. Astrantia major L. Vicarage grounds, Thornhill Lees. Introduced somehow (C. P. Hobkirk).

1090. Bupleurum rotundifolium L. Hare's ear. Cornfield Colonist. Steanard Lane, Mirfield (H. Parkinson).

1742. Anagallis femina (Mill.). (*A. cærulea* Schreb.). As a weed in a garden, Dewsbury. Very different looking from the 'blue-flowered form' of the scarlet Pimpernel. This had deep blue flowers, and was more erect in habit than the commoner species.

2074. Lamium amplexicaule L. Turnip field, Thornhill Edge.

2217. Viscum album L. Mistletoe. Introduced in several gardens, Horbury (W. Rushforth).

(3). Weeds of Waste Places.

81. Papaver dubium L. Waste ground, Netherton.

188. Sisymbrium Irio L. London Rocket. Denizen. Waste place, Crow Nest Park, Dewsbury.

360. Lychnis dioica × alba Mill. (*L. intermedia* Schur.) Calder banks, Shepley Bridge, 1907. 'An evident hybrid, fine, variable, and in quantity' (F. A. Lees and P. F. Lee).

579b. Medicago hispida Gaertn. var. apiculata (Willd.). Manure heap, Thornhill Lees.

596. Melilotus petitpierreana Hayne. (*M. arvensis* Wallr.). Waste ground. Not indigenous.

664. Scorpiurus sulcatus L. Calder bank, Mirfield.

667. Coronilla scorpioides Koch. Corn mill waste ground, Mirfield.

672. HIPPOCREPIS UNISILIQUOSA L. Waste ground, Mirfield (Messrs. Buckley and Jessop).

692. VICIA HYBRIDA L. Waste ground, Mirfield.

1287. ODONTOSPERMUM (BUPHTHALMUM) AQUATICUM Sch.-Bip. 'Native of wet meadows in the Mediterranean region. Recorded by Mr. Lees in his "Flora of West Yorkshire," p. 295, as sent to him (by the writer of this Supplement from Sandal in 1887), from a disused quarry where garden rubbish was thrown. It has also been noticed on waste ground near Bath. It is not grown in gardens, nor is it likely to be imported with grain, so that no clue as to its origin in England could have been suggested, had not chance revealed a channel of introduction. Upon experimentally sowing a sample of bird seed, a few years ago, a quantity of this species came up, and its seed was afterwards recognised in other samples. This is, therefore, probably one of the casuals introduced with foreign bird seed' (Dunn's 'Alien Flora of Britain,' 1905, pp. 105-106).

1335. ACHILLEA CRETICA L. By corn-mill, Shepley Bridge (F. A. Lees).

1363. MATRICARIA DECIPIENS C. Koch. Below corn-mill, Shepley Bridge. Erect, tall, not inodorous, with *Leucanthemum*-like flowers, disk solid, florets of ray upcurved forming a saucer-like flower-face. As its trivial name implies, a deceptive but not unornamental mayweed.

1440. ONOPORDUM TAURICUM Willd. Waste ground, old malting mill, Mirfield.

1648. LACTUCA VIROSA L. Calder bank, Mirfield, as a casual (H. Parkinson).

1796. BORAGO OFFICINALIS L. Waste ground, Mirfield (H. Parkinson).

1831*bis*. VOLVULUS (CALYSTEGIA) INCARNATA L. Calder bank, Lower Hopton (F. Arnold Lees).

1862. VERBASCUM THAPSUS L. Has occurred at Morley as a casual (G. Roberts). *Vide* 'The Flora of West Yorks.', p. 333.

2030. SALVIA VIRIDIS. Alien. Old Cornmill, Ledgard Bridge, Mirfield (Messrs. Buckley and Jessop).

2049. MARRUBIUM VULGARE L. Sweet Horehound. On mill refuse, Batley Carr.

2077. BALLOTA NIGRA L. Black Horehound. Roadside waste ground, Dead Man's Lane, Thornhill. Abundant on Permian limestone, but very rare in this district.

2228. EUPHORBIA SALICIFOLIA Hoet. Hungarian Cornfield alien. Calder bank, Cooper Bridge (Messrs. F. Buckley and A. Jessop), and Dewsbury. 'This is almost certainly identical with the next—a washed down colony of it' (F. A. Lees).

2229. E. ESULA Linn. Alien. Calder bank, Dewsbury; Shepley Bridge. 'Native of woods and meadows in Central and South-East Europe, becoming rarer north-westwards.' (Dunn's 'Alien Flora of Britain, 1905,' p. 169).

2229b. E. ESULA var. PSEUDO-CYPARISSIAS (Jord.). Seed-alien. 'A well established patch of this leafy-branched Spurge on the Calder bank, Mirfield' (H. Parkinson).

(4). ALIENS, WITH STRAW, FODDER, GRAIN, ETC.

184. SISYMBRIUM ALTISSIMUM L. (*S. pannonicum* Jacq.). Waste ground, Mirfield.

185. S. ORIENTALE L. (*S. columnæ* Jacq.). Calder bank. 'Native of dry hills and rocky places in the Mediterranean region' (Dunn's 'Alien Flora of Britain,' 1905, p. 30).

918. POTERIUM POLYGAMUM Waldst. and Kit. (*P. muricatum*). Waste ground, Mirfield (E. T. Gosling).

(5). ALIENS, WITH FOREIGN GRAIN AND GRASS SEED.

14. ADONIS ÆSTIVALIS L. From grain screenings, waste ground, Mirfield (E. T. Gosling).

29. RANUNCULUS TRILOBUS Desf. Waste ground, Shepley Bridge.

152. ALYSSUM HIRSUTUM M. Biel. By Hirst's corn mill, Mirfield.

178. WILCKIA (MALCOLMIA) AFRICANA F. V. Muell. Near old corn mill, Mirfield (Messrs. Buckley and Jessop).

183. SISYMBRIUM SOPHIA L. Malting mill, waste ground, Mirfield.

186. S. AUSTRIACUM Jacq. Malting mill, waste ground, Mirfield. (F. W. Whitaker and P. F. Lee).

200. CONRINGIA ORIENTALIS Dum. Malting Mill, waste ground, Mirfield.

220. BRASSICA HISPIDA Boiss. By corn mill, Mirfield.

237. LEPIDIUM DRABA L. Calder bank, Dewsbury; mill rubbish heap, Batley (F. W. Whitaker).

Native of dry sterile ground in South-east Europe, and Western Asia, being especially abundant in the deserts of the Caspian region.

239. L. PERFOLIATUM L. Malting mill, waste ground, Mirfield.

258. NESLIA PANICULATA Desv. *Clypeola ion-thlaspi*, L. Waste ground, Cornmill, Shepley Bridge (F. A. Lees).

260. MYAGRUM PERFOLIATUM Linn. A grain-screening alien always. From S. E. Europe. Old limekilns, Mirfield (Messrs. F. Buckley and A. Jessop).

263. BUNIAS ORIENTALIS L. Meadow adjoining Hirst's old malt-kiln 'tip,' Mirfield.

276. RAPHANUS LANDRA Moretti. Waste ground, Dewsbury and Horbury Bridge.

331. SAPONARIA VACCARIA L. Waste ground, Horbury Bridge and Shepley Bridge.

Native of oak woods in Asia Minor, and a very common cornfield weed in Eastern Europe and Western Asia. It is one of the most frequently introduced grain aliens in Britain; it occurs here also as a weed of cultivated ground, possibly from the use of foreign seed (Dunn's 'Alien Flora of Britain, 1905,' p. 37).

336d. SILENE LATIFOLIA var. OLERACEA (Bor.). Waste ground below cornmill, Shepley Bridge. This pretty nodding laxifloral campion, is a variety of our British *inflata*, with less swollen calyx. The Eastern race as it were, and where hitherto found, as at Woolwich Arsenal, is rightly 'suspect' as being a foreigner (F. A. Lees).

341. S. DICHOTOMA Ehrh. Waste ground, Mirfield.

342. S. GALLICA L. Calder bank, Shepley Bridge. The name is a little doubtful (Lees). Mill waste heap, Batley Carr.

344. S. QUINQUEVULNERA L. Waste road-side, Mirfield. A rare plant of the Channel Islands. Here a grain or grass-clover seed brought casual from S. Europe.

398*bis*. ARENARIA STELLARIOIDES Willd. Waste ground by old Malt-kilns, Mirfield. 'A colonising alien from the Caucasus and the Euxine, probably brought first to the Halifax (in 1895) and later Elland and Mirfield riparian area.' (F. A. Lees, 'The Naturalist,' p. 100, March, 1909). The writer found it at Mirfield, as above in 1907-8-9.

554. TRIGONELLA CŒRULEA Ser. By malt-kiln, Mirfield (Messrs. F. Buckley and A. Jessop).

562. MEDICAGO FALCATA L. Waste ground, Dewsbury Mills, Shepley Bridge.

622. TRIFOLIUM RESUPINATUM L. Casual of grass-seed origin. Old lime-kilns, Mirfield (Messrs. Buckley and Jessop).

625. T. SPUMOSUM L. Waste place by Sutcliffe's corn mill, Mirfield.

644. LOTUS TETRAGONOLOBUS L. By malt-kiln, Mirfield (Messrs. F. Buckley and A. Jessop).

658. ASTRAGALUS SESAMENS L. Malt-kiln waste ground, Mirfield.

668. ORNITHOPUS COMPRESSUS L. Waste ground, Mirfield.

681. VICIA VILLOSA Roth. Waste ground, Shepley Bridge.

684. V. PSEUDO-CRACCA Bert. Waste ground, corn-mill, Shepley Bridge.

(*To be continued*).

***Trollius europaeus* in Div. II. S. W. Cumberland.**—On Whit Monday, May 27th, Miss Isabel Dobson gathered fine blooms of *Trollius europaeus* which was found growing abundantly on the banks of Black Beck where the footpath between Swinside and Windy Slack crosses the stream by a narrow wooden bridge.—JOHN DOBSON, Ulverston.

The Kite in Yorkshire in 1682.—The following is taken from the notes made by Oliver Heywood, the celebrated Non-conformist preacher. He was then at Northowram :—' Young turkey catched, Object 13.—My wife had orded an hen to sit on turkey eggs, hatcht them, all came to naught except two, those two were with the hen in the croft feeding, on Saturday forenoon, Aug. 5, 1682, a glead came furiously to catch them, the hen fought with the glead a considerable time, but the glead catcht one of them, and went away with it, chirping in his mouth, some young men at R.S. seeing the sharp contest, and the glead carrying the chicken, ran after him, he light in a field near to feed on his prey, but, seeing them, took it up and fled away with it, so they lost it, the other Chicken or young Turkey, being affrighted, hid itself under shrubs, which, in a little time they found, the hen going with it was still erecting her head waiting for the glead, it came for the other, she got under a stone in the court, the chicken under her, sate close, secur'd it, and still is exceedingly watchful.'—*Oliver Heywood's Diaries*, 1630-1702. Ed. Horsfall Turner, Vol. IV., p. 44. The capitals and commas are as in the volume.—S. L. PETTY.

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REVIEWS AND BOOK NOTICES.

Indoor Gardens, by T. W. Sanders, F.L.S. London Agricultural and Horticultural Association. Price 1d.

To facilitate the art of Indoor Gardening, and to explain how it may be best developed and carried out, is the object of this handbook. The author's very practical suggestions are aided by excellent illustrations on every page.

At what seems to us to be a rather high price of 5/-, Messrs. Stanford have published a **Geological Map of Central Europe,** at a scale of 1 : 6,336,000 the size of the map being 16½ by 10½ inches. It is reduced from the Carte Geologique Internationale de l'Europe. The map certainly serves a useful purpose, though, on account of its small scale, many formations have been lumped together which might have been differentiated.

A Hand-List of British Birds, with an Account of the Distribution of each Species in the British Isles and Abroad. By **Ernst Hartert, F. C. R. Jourdain, N. F. Ticehurst, and H. F. Witherby.** 8vo. London : Witherby & Co. 1912. xii., 237 pp. Price 10/6.

This is the first direct and straightforward attempt to place the nomenclature of British birds on the definite footing of strict priority, and a great deal of time and trouble has been expended towards that most desirable end. It has been based on Article 26 of the ' International Rules of Zoological Nomenclature,' which reads as follows :—' The tenth edition of Linnæus' " Systema Naturæ," 1758, is the work which inaugurated the

consistent general application of the binary nomenclature in zoology. The date 1758 therefore, is accepted as the starting-point in zoological nomenclature and of the Law of Priority.'

The work also takes account of the use of trinomials for sub-species in the following words :—'As to the use of trinomials for sub-species, or, better, geographical or local races, does not seem to be generally understood, it may here be explained that when a species is divided into two or more races, or when two or more species are grouped as races of one species, then each of these races must have a trinomial appelation. It is impossible to say which is the oldest or parent form, therefore, the first-named race of all those grouped under one species is arbitrarily taken as the typical race, and its name becomes that of the species.

'Thus *Parus major* is the species of the Great Tit, and includes all the Great Tits just as the genus *Parus* includes all the Tits. As the form of Great Tit inhabiting northern Europe was the first to be named, it must be called *Parus major major*, and all other names of Great Tits must have as their first two names *Parus major*. Similiarly the typical race of Wren must be called *Troglodytes troglodytes troglodytes* if it is to be distinguished from *Troglodytes troglodytes hirtensis*, or any other race of Wren. It must be understood that the binomial *Parus major* or *Troglodytes troglodytes* refers to the species, *i.e.*, the whole group of sub-species, and cannot be used to differentiate one of those sub-species. It cannot be gainsaid that the trinomial system is of the greatest possible use scientifically as demonstrating the close relationship of geographical forms of the same species, just as the binomial system demonstrates the relationship of species of the same genus.'

The work before us, in dealing with *Parus major* (to continue the example quoted), shows us on page 42 under the heading PARUS MAJOR, that the Continental Great Titmouse, *Parus major major*, as named by Linnæus *Parus major*, was named from a Swedish specimen, and, although living here, differs from *Parus major newtoni* of Prazak, which is a race confined to the British Isles, so far as is at present known. For these differences the reader is referred to the original literature as this book does not profess to be descriptive. But the distribution of the two forms is carefully given, and the synonyms pointed out.

Having thus briefly sketched the object and aims of this book, we can only commend it to the reader as of extreme value, and no little interest generally, from its careful introduction dealing with nomenclatorial questions, and its conscientious handling of a difficult and complicated subject. We thank Dr. Hartert and his collaborators for their pains, and entirely agree with the greater part of their conclusions, which are based on direct and careful investigation of original sources.

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PROCEEDINGS OF SCIENTIFIC SOCIETIES.

The **Belfast** Museum has issued its publication, No. 33, being its Quarterly Notes, No. XXI. It contains notes on local medals and tokens, the Donegall family, and the House Fly. It is illustrated.

The **Proceedings of the Geologists' Association** (Vol. XXIII., part 3), contain a paper on 'The Classification of Palæolithic Stone Implements,' by Reginald A. Smith. The Association seems to have had a good round of visits to museums and private collections, reports upon which appear in the same part of the Proceedings.

The **Report and Proceedings of the Manchester Field Naturalists' and and Archæologists' Society** for the year 1911 has recently appeared, and contains details of the Club's various field meetings, which have a strong botanical and archæological flavour. The Society paid a lengthy visit to Yorkshire, which is fully reported, and includes a good account of a lecture on the birds of the county, by Mr. Riley Fortune.

From the **Birmingham Natural History and Philosophical Society** we have received its **Proceedings** (Vol. XII., No. 5, pp. 1-23), entirely occupied by a paper on the Algæ of Stanklin Pool, Worcestershire, by B. M. Griffiths. It is illustrated by diagrams. The same Society's **Annual Report for 1911** contains details of the work done by the different sections, and there are particulars of recent exposures in the drift on the Great Western Railway, with illustrations.

Vol. LVI., part 11 of the **Memoirs and Proceedings of the Manchester Literary and Philosophical Society** contain, among others, a paper on the 'Presence of Maxillulæ in the Larvæ of Dytiscidæ,' by J. Mangan; 'On the Interpretation of the Vascular Anatomy of the Ophioglossaceæ,' by W. H. Lang; and 'The Smelt in Rostherne Mere,' by T. A. Coward. Apparently this mere is the only locality in England where the smelt can be obtained inland, and the species seems there to have become accustomed to the fresh-water conditions.

Vol. II., No. 4 of the **Journal of the East Africa and Uganda Natural History Society** (pp. 79-139, 5s. 4d.), has been published by Messrs. Longmans, Green & Co. There are papers on Fish Culture in British East Africa; the Biting Flies of the same district; Collecting and Drying Plants; Fish in Lake Magadi; the Water Elephant; a human skull from British East Africa; the Importance of Africa in Vertebrate Palæontology, and Bats. There are a number of shorter notes, and amoug the few illustrations is a reproduction of a photograph of the skin of a Saddle-backed Zebra.

The **Transactions of the North Staffordshire Field Club,** Vol. XLVI. for 1911-2, edited by the Hon. Secretary, Mr. W. Wells Bladen, form a substantial volume of over 160 pages. Besides containing reports on the birds, entomology, botany, geology, meteorology, archæology, etc., of North Staffordshire, there are a number of well-illustrated papers, principally of an antiquarian character. Among those likely to interest our readers are 'The Roman Camp at Chesterton,' by S. A. H. Burne; 'An Astronomical Study of some ancient Monuments,' by A. M. McAldowie, and the reports of the excursions.

Under the editorship of Mr. C. E. Bowles, the **Derbyshire Archæological and Natural History Society** has recently issued volume XXXIV. of its Journal, which contains over 250 pages, and numerous illustrations. Most of the papers have an antiquarian interest, but among those likely to interest our readers are 'Cinerary Urn found near Eyam,' by R. M. S. O'Ferrall; 'Ravencliff Cave,' by R. A. Smith; 'Fin Cop Prehistoric Fort,' by E. Tristram; 'Milandra Castle Excavations,' by H. Lawrence, an excellent 'Zoological Record for Derbyshire, 1911,' by F. C. R. Jourdain, and 'Lepidoptera,' by H. C. Hayward.

The Forty-first Annual Report of the **Chester Society of Natural Science,** etc (48 pp., 1912)), contains details of the additions to the Society's Library and Museum, and also the sectional Secretaries' reports. The last include reports of lectures, a few ornithological records, and a description of a new diatom from Bournemouth, viz., *Coscinodiscus heliozoides*, Siddall. We learn that Mr. Siddall has read a paper on the subject before the Royal Microscopical Society, so that if the Chester Society's report has appeared first, the species will not be "n. sp." when the paper in the Royal Microscopical Society's Journal is published.

The Annual Report for 1911 of the **Scarborough Philosophical and Archæological Society** has been published, and includes the report of the **Scarborough Field Naturalists' Society.** Both appear to have had a good year. The Recorders' reports published by the latter society contain many valuable natural history records, particularly under the heads of Marine Invertebrate Zoology, and Coleoptera. The records are contributed by Messrs. W. J. Clarke, A. S. Tetley, E. A. Wallis, E. C. Horrell, E. B. Lotherington, J. Irving, J. A. Hargreaves, E. R. Cross, A. E. Peck, and H. C. Drake. The Societies' Balance Sheets are satisfactory, and intelligible.

NOTICE.

The **Annual Meeting** of the **Marine Biological Committee** will take place at **Robin Hood's Bay, October 11-15.** Professor Garstang of Leeds, and Professor Denny of Sheffield University, have kindly consented to allow the use of the Marine Laboratory, lately instituted there, as the centre for meetings and work. It is hoped that many members will avail themselves of the special opportunities of studying marine life in its various forms. All communications with respect to it should be addressed to Rev. F. H. Wood, Bainton Rectory, Driffield.

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ON *Rhadinichthys morensis* AND ITS DISTRIBUTION IN THE YORKS. COALFIELD. F. D. Wellburn. (Illus.).
GEOLOGY OF SNOWDEN. J. R. Dakyns.
DIAGRAM OF COMPOSITION OF IGNEOUS ROCKS. H. Worth.
COL. FEILDEN'S CONTRIBUTIONS TO GLACIAL GEOLOGY. T. G. Bonney.
CONSOLIDATION OF MINERALS IN IGNEOUS ROCKS. W. J. Sollas.
FAUNA OF UPPER CASSIAN ZONE IN FABJAREGO VALLEY, SOUTH TYROL. M. M. O. Gordon.
GEOLOGY OF BAD NAUHEIM AND ITS THERMAL SALT SPRINGS. A. V. Jennings. (Illus.).
NEPHALINE SYENITE AND ITS ASSOCIATES IN THE N. W. OF SCOTLAND. J. J. H. Teall.
PODOPHTHALMOUS CRUSTACEANS FROM UPPER CRETACEOUS, BRITISH COLUMBIA. H. Woodward. (3 Plates).
PALAEOLITHIC FLINT IMPLEMENTS FROM THE ISLE OF WIGHT. S. H. Warren.
A GRANOPHYRE DYKE INTRUSIVE IN THE GABLERO OF ARDNAMURCHAN SCOTLAND. K. Buzz.
AGE OF THE RAISED BEACH OF SOUTHERN BRITAIN AS SEEN IN GOWER. R. H. Tiddeman.
RESTORATION OF *Stylonurus lacoanus*, A GIANT ARTHROPOD. C. E. Beecher (Plate).
ON *Hyperodapedon Gordoni*. R. Burckland. (Pate).
A SUMMARY OF PRESENT KOWLEDGE OF EXTINCT PRIMATES FROM MADAGASCAR. C. T. F. Major.
PLEISTOCENE SHELLS FROM RAISED BEACH DEPOSITS OF RED SEA. R. B. Newton. (3 Plates).
NOTES ON REMAINS OF CRYPTOCLEIDUS FROM THE KELLAWAYS ROCK OF EAST YORKSHIRE. T. Sheppard.
COAL PLANTS. W. S. Gresley. (Illus.).
ZEITEN'S TYPES OF AMMONITES. G. C. Crick.
WENLOCK SPECIES OF LICHAS. F. R. C. Reed. (Plate).
ORGINAL FORM OF SEDIMENTARY DEPOSITS. J. F. Blake. (Illus.).
QUARTZ DYKES NEAR FOXDALE, ISLE OF MAN. J. Lomas.
NEOLITHIC FLINT IMPLEMENTS FROM THE FAYUM, EGYPT. H. J. L. Beadnell. (2 Plates).
CONSTITUTION OF LATERITE. T. H. Holland.
DEVELOPMENT OF RIVER MEANDERS. W. H. Davis. (Illus.).
CREECHBARROW IN PURBECK. W. H. Hudleston. (Illus.)
COMPOSITION OF INDIAN LATERITE. H. Worth.
BRACHYMETOPUS. F. R. C. Reed.
LOWER PLIOCENE BONE-BED OF CONCUD PROVINCE OF TERUEL, SPAIN. A S. Woodward. (Plate).
DIFFUSION OF GRANITE INTO CRYSTALLINE SCHISTS. E. Greenby. (Plate).
VEIN-QUARTZ AND SANDS. A. R. Hunt.
CAVE HUNTING IN CYPRUS. H. Woodward.
DISAPPEARANCE OF LIMESTONES IN HIGH TEESDALE. C. T. Clough.
SPECIMENS FROM THE CANADIAN ROCKY MOUNTAINS. T. G. Bonney. (Plate).
ISOCHILINÆ FROM N. AMERICA. T. R. Jones. (Illus.).
EXPEDITION TO FAYUM, EGYPT, WITH DESCRIPTIONS OF NEW MAMMALS. C. W. Andrews. (Illus.).
STRUCTURE OF THE PALATE IN THE PRIMITIVE THERIODANTS. R. Brown.
RIVER CURVES ROUND ALLUVIAL PLAINS. T. S. Ellis.
ON HOMÆOMORPHY AMONG FOSSIL PLANTS. E. A. N. Arber.
FOSSILIFEROUS BED IN THE SELBORNIAN OF CHARMOUTH. W. D. Lang.
SOME DISPUTED POINTS IN CRYSTALLISATION OF THE CONSTITUENT MINERALS OF GRANITE. A. R. Hunt.
THE FUNCTIONS OF GEOLOGY IN EDUCATION AND PRACTICAL LIFE. W. W. Watts. (18 pp.).
OLDHAVEN BEDS AT IPSWICH. H. Bassett.
STRAIGHT SHELLED NAUTILOIDEA COLLECTED IN NORTH CHINA. G. C. Crick. (Plate).
A CARBONIFEROUS ICHTHYODORULITE. A. S. Woodward.
NEW EGYPTIAN MAMMAL FROM THE FAYUM. (Plates).
NEW CARNIVORA FROM THE MIDDLE MIOCENE OF LA GRIVE, SAINT ALBAN, ISERE FRANCE. C. T. Major.
AGE OF PYRENEAN GRANITE. P. W. S. Menteath.

NOTES AND COMMENTS.

THE BRITISH ASSOCIATION.

Dundee has demonstrated that, to a large extent, the success of a meeting of the British Association for the Advancement of Science depends upon the way in which it is supported locally. The town itself has nothing like the attractions that many of the towns and cities recently visited have had, and yet the number attending the meeting far exceeded any attained for many years. The amount locally subscribed for entertaining the members was unusually large ; there were over a thousand local members, and probably a greater proportion of the visitors was privately entertained than has been the case for a considerable time. When it is remembered that at the York meeting in 1906 (the seventy-fifth anniversary meeting) there were 1972 members ; at Sheffield in 1910, 1449 members ; and at Portsmouth last year only 1241 members present, the Dundee figure of 2500 is very satisfactory. At the previous Dundee meeting in 1867 the membership was 2444.

THE HANDBOOK.

The handbook prepared for the use of the members, under the editorship of Messrs. A. W. Paton and A. H. Millar, was all that could be desired, and, in keeping with everything else, was exceptionally well done. It contained 700 pages, a coloured geological map, and an excellent Botanical Survey Map of Fife and Forfarshire, by the late Robert Smith, and W. G. Smith. The volume contains chapters on history, commerce, education, architecture, geology, botany, natural history, art, etc., all, of course, having reference to the Dundee area. Not only were the members provided with this handbook, but with handbooks on Dundee from the Cars ; Excursions, Local Arrangements, Reports of the Medical Officer, Free Libraries, etc.

SECTIONAL REPORTS.

An innovation at this meeting was the fact that it was possible to purchase the presidential address and printed abstracts of the papers read in any section, all stitched together in one cover. Some of these were issued at sixpence, others at ninepence, though we think the former price sufficient for each. As probably each of the members attending the meeting would be glad to get the papers read at the particular section in which he is interested, in this handy form, there should have been a large sale of these reprints. Possibly there was. Personally we don't think they were brought sufficiently before the notice of the members.

THE ANNUAL REPORT.

This brings us to the old question of the delay in the publication of the Report of the Meeting. By placing these sectional reports together, adding the presidential address, list of members, etc., (all of which were in type at Dundee), it means that the report is ready, except for the page numbers being altered, and the index. Surely this should not take nine or ten months ?

THE PRESIDENTIAL ADDRESS.

As in so many instances recently, the presidential address was a wearying business. Notwithstanding the lauditory remarks made during the week in Dundee, and by the press, it was not the greatest of pleasures to have to sit for two hours trying to catch words which were scarcely audible to those occupying the front rows. When it is remembered that the hall contained many hundred local ladies and gentlemen who were supporters of the Association, it seems a bad start to make them sit still during a very long evening, most of them not hearing a word of the address. Many of the occupants of the platform had copies of the address in their hands while it was being read, anyone could get them on the following morning, either in the reception-room or in the press. In these circumstances, it seems a pity that arrangements could not have been made to have given a resumé of the address, not more than an hour in length. And, in the interests of the advancement of science, a president who cannot make himself heard, should either take lessons in elocution, or allow someone to read the address for him.

THE ORIGIN OF LIFE.

As regards the address itself, there has, of course, been every praise given to it, and unquestionably it is a fairly comprehensive account of the present position of the question of the origin of life. On the other hand, after all, the address does not seem to have advanced the discussion very far, and, in parts at any rate, there was just a suspicion of ' playing to the gallery.'

SPONTANEOUS GENERATION.

In view of the remarks made in this column a little while ago, in reference to the origin of life (page 203), it was of interest to hear Prof. Schäfer say, ' I do not hesitate to believe, if living torulae or mycelia are exhibited to me in flasks which had been subjected to prolonged boiling after being hermetically sealed, that there has been some fallacy in the premises or in the carrying out of the operation. The appearance of organisms in such flasks would not furnish to my mind proof that they were the result of spontaneous generation. Assuming

no fault in manipulation or fallacy in observation, I should find it simpler to believe that the germs of such organisms have resisted the effects of prolonged heat than that they became generated spontaneously. If spontaneous generation is possible, we cannot expect it to take the form of living beings which show so marked a degree of differentiation, both structural and functional, as the organisms which are described as making their appearance in these experimental flasks.'

FORMATION OF LIVING SUBSTANCE.

'Nor should we expect the spontaneous generation of living substance of any kind to occur in a fluid the organic constituents of which have been so altered by heat that they can retain no sort of chemical resemblance to the organic constituents of living matter. If the formation of life—of living substance—is possible at the present day—and for my own part I see no reason to doubt it—a boiled infusion of organic matter, and still less of inorganic matter, is the last place in which to look for it. Our mistrust of such evidence as has yet been brought forward need not, however, preclude us from admitting the possibility of the formation of living from non-living substance. Setting aside, as devoid of scientific foundation, the idea of immediate supernatural intervention in the first production of life, we are not only justified in believing, but compelled to believe, that living matter must have owed its origin to causes similar in character to those which have been instrumental in producing all other forms of matter in the universe; in other words, to a process of gradual evolution.'

£10,000.

After the presidential address, the Lord Provost of Dundee had a pleasant surprise for the members. This was nothing less than a cheque for £10,000, given unconditionally to the Association, by Mr. J. K. Caird, 'for the advancement of science.' This gift, remarkable to state, seems to be unique in the annals of the British Association. Each year various sums of money are voted to the committees of research, etc., such sums varying according to the success of the meeting. The extent of the research carried on by the various committees during the intervals between the annual meetings is largely governed by the amount voted at the general meeting. Consequently it is clear that the greater the sum available, the better for the advancement of science. Yet it has remained for Dundee, and Mr. Caird, to carry on this excellent work independently of the income derived from any particular meeting. It is to be hoped that this magnificent example may be followed in future years.

SIR JOSEPH HOOKER

At the Conference of Delegates, the Chairman, Professor F. O. Bower, F. R.S. dealt with the life and work of Sir Joseph Hooker, whose death, in December, 1911, may be held to have been one of the most outstanding events of the year. He did not give any consecutive biographical sketch of this great botanist, but indicated the various lines of activity in which he excelled. He contemplated him as a traveller and geographer, as a geologist, as a morphologist, as an administrator, as a scientific systamatist, and, above all, as a philosophical biologist. As a traveller Sir Joseph visited all the great circumpolar areas of the Southern hemisphere. He spent almost four years in India. He botanised in Palestine and in Morocco, and finally in the Western States of America. The results he worked up into such a great floristic publications as the Antarctic flora and the flora of British India. As an administrator he guided for thirty years the destinies of Kew, and served for five years as President of the Royal Society. As a scientific systematist he co-operated in the Genexa Plantarum and the Kew Index.

A PHILOSOPHICAL BIOLOGIST.

But it was perhaps, as a philosophical biologist that he rose to the greatest heights. An early friend of Darwin, he was the first to accept his views. In 1859 Darwin himself wrote: 'As yet I know only one believer, but I look at him as of the greatest authority—viz., Hooker.' While Lyell wavered, and Huxley had not yet comein, Hooker was in 1859 a complete adherent to the doctrine of the mutability of species. But this position was confirmed by a masterly series of essays from his own pen. The most notable address was the introduction to the flora of Tasmania. The last was that notable address to the Geographical Section of the British Association at York in 1881 on 'The Geographical Distribution of Organic Beings.' It was such works as these which led to the cumulative result that he was universally held to have been the most distinguished botanist of his time.

ADDRESS TO THE BOTANICAL SECTION.

Professor Keeble gave some useful hints to the botanists in his address at Dundee. The recent death of Sir Joseph Hooker served as a pretext for comparing present day biologists with the more versatile workers of the Victorian age. The present generation, he said, has become expert in intensive cultivation of scientific knowledge, but it has forgotten how to market its produce. In the pre-occupation of specialisation it neglects the art of expression. It sinks the artist in the

artizan. There is too great a tendency to think in symbols and to write in shorthand. We have failed to cultivate sufficiently the art of expression and neglected too much the literary side of education. He blames the Victorians, however, for not realising that Mendel was living amongst them, and shows that the merit of the discovery of the greatness of Mendel's work belongs to our generation, and that while we must give to the Victorians the higher need of culture, to us, perhaps, belongs the greater perspicacity. If, he says, the greatest gift which an experimental science may receive is that of a new, serviceable, general method, then to no man are biologists more indebted than to Mendel, for such a method he gave to our science.

MENDELISM.

From this it was an easy step to Mendelism, which formed the major part of his address. He gave an interesting account of recent work on pigmentation in flowers, dealing especially with the peculiarities of the two races of white flowered varieties which occur in the Chinese Primrose, Sweet William, and Sweet Peas, and their behaviour when crossed with coloured forms; also the distribution of oxydase and peroxydase in plant tissues and the part they play in the formation of Authocyan pigments. Plants subjected to normal illumination possess less oxydase than those kept in darkness and after exposure for one or two days to darkness, plants contain more peroxydase than those kept under normal conditions of illumination. He suggests that in these variations in oxydase content we may discover therein the means whereby many of the phenomena of periodicity exhibited by plants are maintained and regulated, *e.g.*, diurnal and nocturnal positions of leaves, also the phenomena seen in such species as *Hippolyte varians*, which roll up their brilliant chromatophores at night and assume a sky-blue colour. When daylight comes they put on their day-time dress by spreading out the pigment of their chromatophores in far-reaching superficial networks. The speculation may be permitted that light and darkness may work these wonders through the control of chemical agents such as oxydases.

The Royal Horticultural Society has awarded its gold medal to Prof. Newstead, of the University of Liverpool, for his exhibit of insects injurious to cultivated plants, at the Royal International Horticultural Exhibition.

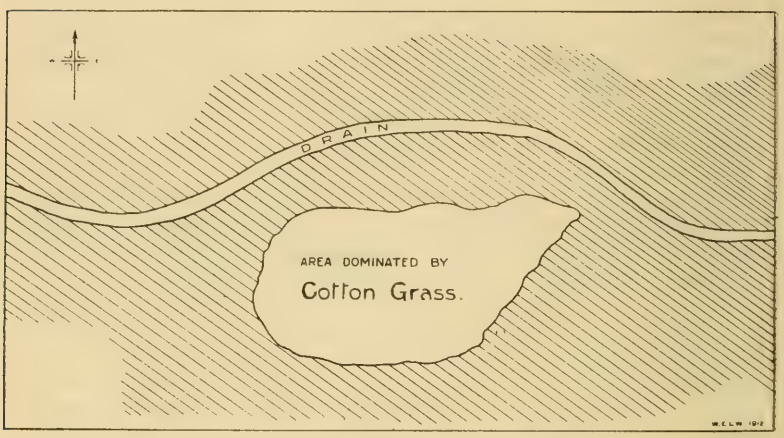
Referring to Mr. J. K. Caird's gift of £10,000 to the British Association, the *Dundee Evening Telegraph* stated 'Prof. Schäfer will admit that from a British Association point of view, Mr. J. K. Caird's demonstration of the spontaneous production of sponduliks is more important than the prophesies concerning possibilities of spontaneous generation.'

BUCKTON MARSH, EAST YORKS.

W. E. L. WATTAM,
Huddersfield.

Buckton Marsh was visited by members of the Yorkshire Naturalists' Union on Whit Monday last, and a brief reference is made to the visit on pages 213 and 223 in the June issue of "The Naturalist.' Photographs of the marsh also appear on pages 213 and 222.

While at Bridlington in August I took the opportunity of investigating this interesting piece of ground. It is about half a mile north-east from the village of Buckton, at the top of the old lane leading up from Buckton Mere. Apparently



Area of Buckton Marsh dominated by Cotton Grass.

no attempt has been made to drain the area of three to four hundreds yards of, what might now be termed, rough pasture. The ground slopes slightly to the north-east, and has a more pronounced slope to the south-east. The shallow basin thus formed evidently received the drainage, as now, from more highly cultivated lands surrounding, and becoming water-logged, the land became controlled by the Cotton Grass (*Eriophorum*) and its associates, to a far greater extent than is now the case. It is this remnant of Cotton Grass bog which is being slowly but surely driven to extinction, that makes Buckton Marsh worthy of a visit.

The soil of the slightly higher portions of the ground surrounding the marsh is of a sandy-clay nature, and has a flora typical of such ground. The dominant grass is the Common Bent (*Agrostis vulgaris*). There are also the Quake Grass

(*Briza media*), Crested Dog's-tail Grass (*Cynosurus cristatus*), and Cock's foot Grass (*Dactylis glomerata*). Associated with these are the Mouse-ear Chickweed (*Cerastium triviale*), Creeping Cinquefoil (*Potentilla reptans*), Great Knapweed (*Centaurea Scabiosa*), Smooth Hawk's-beard (*Crepis virens*), Yarrow (*Achillea Millefolium*), Harebell (*Campanula rotundifolia*), and others. As will be seen by the crossed portions on the sketch-map, the area which has been practically conquered by wet-loving plants is of considerable extent, and the cotton grass remnant is encircled by this phase of vegetation. The reclamation of these areas is no doubt due to the drain, the waters of which have cut across practically from east to west, a channel of varied depth, and as this channel deepened it drained the area in a natural manner. The conditions becoming less water-logged, the rushes, sedges, and grasses acted as pioneers in ousting the cotton grass, and paved the way for the other wet-loving plants which here make home. These areas having a peaty subsoil, still retain a considerable amount of moisture.

The rushes which occur here are the Jointed Rush (*Juncus acutiflorus*), Spreading Rush (*J. effusus*), and Toad Rush (*J. bufonius*), where competition is not severe. The chief Sedges are the Pink-leaved Sedge (*Carex panicea*), Yellow Sedge (*C. flava*), and Glaucous Sedge (*C. glauca*), and the grass sward is comprised of the Tufted Hair Grass (*Deschampsia cæspitosa*) as dominant, Soft Grass (*Holcus lanatus*), and Cock's-foot Grass. Completing this moist-loving complement are Lesser Spearwort (*Ranunculus Flammula*), Creeping Crowfoot (*R. repens*), Marsh Marigold (*Caltha palustris*), Water Cress (*Nasturtium officinale*), Ladies' Smock (*Cardamine pratensis*), Marsh Stitchwort (*Stellaria uliginosa*), Ragged Robin (*Lychnis flos-cuculi*), Marsh Bedstraw (*Galium palustre*), Marsh Valerian (*Valeriana dioica*), Marsh Thistle (*Cnicus palustris*), with white flowered form, Sneezewort (*Achillea Ptarmica*), Water Mint (*Mentha aquatica*), Common Bugle (*Ajuga reptans*), Spotted Orchis (*Orchis maculata*), and Smooth Horsetail (*Equisetum limosum*). Where richer humus has accumulated, and conditions tend to a drier state, other plants are gradually asserting themselves, such as Red Clover (*Trifolium pratense*), White Clover (*T. repens*), Least Clover (*T. dubium*), Greater Birdsfoot (*Lotus tenuis*), Tufted Vetch (*Vicia Cracca*), Black Knapweed (*Centaurea nigra*), Field Sorrel (*Rumex acetosa*), Rye Grass (*Lolium perenne*), and Cat's Tail Grass (*Phleum pratense*).

The extreme verge of the cotton grass bog remnant is bordered by a growth of wet-loving grasses, the species being the Whorled Grass (*Catabrosa aquatica*), Water Sweet Grass (*Glyceria fluitans*), Tufted Hair Grass and Elbowed Fox-tail

Grass (*Alopecurus geniculatus*), along with the Soft Grass, Creeping Crowfoot, and Toad Rush. The portion dominated by the Narrow-leaved Cotton Grass (*Eriophorum vaginatum*) is about twenty-five yards in extent, ten yards being about the width of the broadest part. Within this area is the flora, which at one time there is no reason to doubt, controlled the greater portion of Buckton Marsh. It is now the refuge of the following plants, many of which, as the natural drainage continues to operate, making more easy the conquest of the soil by stronger growing plants which encircle it, will, within no great length of time, be non-existent, namely, Marsh Marigold, Lesser Spearwort, Bog Stitchwort; Grass of Parnassus (*Parnassia palustris*), rare, seven plants only seen, three in bloom; Sundew (*Drosera rotundifolia*) four plants only seen; Marsh Valerian, Marsh Cudweed (*Gnaphalium uliginosum*); Bog Pimpernel (*Anagallis tenella*), very rare; Bog Bean (*Menyanthes trifoliata*), plentiful; Forget-Me-Not (*Myosotis palustris*), Water Mint, Marsh Lousewort (*Pedicularis palustris*); Common Butterwort (*Pinguicula vulgaris*), fourteen plants seen; Common Bugle, Marsh Orchis (*Orchis latifolia*), Spotted Orchis, Jointed Rush, Marsh Grass (*Triglochin palustre*), abundant; Chocolate-headed Rush (*Scirpus pauciflorus*), Pink-leaved Sedge, Yellow Sedge, Glaucous Sedge, Hairy Sedge (*Carex hirta*), Paradoxical Sedge (*C. paradoxa*), Short-beaked Bladder Sedge (*C. vesicaria*), Loose Sedge (*C. distans*), Smooth Horsetail (*Equisetum limosum*), Marsh Horsetail (*E. palustre*) and the moss *Hypnum cuspidatum*.

The drain has its origin from a pool a short distance eastwards from the marsh, where the drainage from adjacent cultivated lands is carried by pipes. It varies in depth from twelve to eighteen inches. Its flora is likewise interesting, and, of course, typical of such a habitat, the chief plants being Water Crowfoot (*Ranunculus circinatus*), Ivy-leaved Crowfoot (*R. hederaceus*), Water Starwort (*Callitriche verna* and its sub-species *hamulata*), Water Cress, Marsh Marigold, Brooklime (*Veronica Beccabunga*), Water Speedwell (*V. Anagallis-aquatica*), Forget-Me-Not, Spreading Rush, Whorled Grass, and Elbowed Fox-tail Grass. This drain is the chief feeder of the Mere on the outskirts of the village of Buckton.

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Mr. H. Wallis Kew sends us a reprint of a paper on the extraordinary observations he has made with regard to the Pairing of Pseudoscorpiones (*Proceedings Zoological Society of London*, June 1912, pp. 376-390).

We quote the following natural history gem from a well known daily paper:—'RARE BIRD VISITOR.—Mr. C. Pattison Lowther, F.Z.S., who is staying at Kingsdown, near Deal, reports having seen a very rare bird, the Burm, near Sandown Castle. He believes this bird has never before been recorded in England. It is of the petrel class and is a native of the Sahara. Its peculiar reverse flight in stormy weather makes it very noticeable.'

Naturalist,

FIELD NOTES.

FLOWERING PLANTS.

Cotyledon in South-West Cumberland.—To Miss Dobson's find for Hodgson's Div. II., South West Cumberland, may be added *Cotyledon umbilicus* L., which I found on a bank not far from Silecroft Church. Hodgson has no record for Div. II.—MABEL PETTY, Ulverston.

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MAMMALS.

Pygmy Shrew near Scarborough.—A Pygmy Shrew was taken by Mr. H. Witty, on July 21st, 1912, at Seamer Moor, and was brought to me for identification. This species is probably more abundant than the number of local records (two) indicate, as it is doubtless frequently confused with the common species.—W. J. CLARKE, Scarborough.

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BIRDS.

Levantine Shearwater at Scarborough.—An adult Levantine Shearwater was shot a few miles south-east off Scarborough from a boat, in the dusk of the evening of September 3rd, and was brought to me in the flesh the same night.—W. J. CLARKE, Scarborough.

Melanic Guillemot at Filey.—On July 9th, 1912, while upon Filey Brig, I saw a flock of Common Guillemots pass at a distance of about fifty yards from where I was standing. One of the individuals appeared to be of a uniform black, or dark brown all over above and beneath, the under parts being, so far as I could see at the distance, equally as dark in colour as the upper. The bird was much too large to be *Uria grylle*, and lacked the white patches which this species has on the wings. I have no doubt that it was a melanic variety of the Common Guillemot (*U. troile*).—W. J. CLARKE, Scarborough.

Honey Buzzard, etc., at Hebden Bridge.—It was reported to me in July that a strange bird was frequenting the moors at the head of the Cragg Valley, and that it had also been seen in the wooded portion considerably farther down. My one journey to the latter place in the hope of discovering it was unsuccessful; as a matter of fact, as I heard later, the stranger had then been killed. Mr. W. Lord, taxidermist, Rochdale, received the bird for preservation, and in reply to my enquiry, he stated that it was a fine example of a male Honey Buzzard, of which my only previous record for the Hebden Bridge district is extracted from 'The Field,' and refers to an individual shot at Blackstone Edge on October 8th, 1866. A Scoter which I saw at Withens reservoir on August 10th, had been on that water for at least three weeks previously, according to the waterman.—WALTER GREAVES.

MOLLUSCA.

Marine Shells at Bridlington.—At a visit to Bridlington on July 30th, I came across several interesting shells, which should be added to the list obtained there at the meeting of Yorkshire naturalists on May 27th, viz. :—*Gari* (*Psammobia*) *feroensis, Cultellus pellucidus, Capulus hungaricus, Natica catena, Turritella communis, Ocinebra* (*Murex*) *erinacea, Nassa reticulata, Nassa incrassata, Bela trevelyana.* Of these, *Nassa reticulata* and *Ocinebra erinacea* were very much worn, and *Turritella communis* is only a fragment of a half-grown shell. This mollusc abounds at Redcar, from which locality the shell has been probably washed down. *Nassa reticulata*, though one of the commonest shells of our southern shores, is very rarely found on the Yorkshire coast. This is only the second specimen which I have come across ; the other was at Scarborough, and was also much worn. *Capulus hungaricus* is the largest specimen I have found on our coast, the young shell being not at all uncommon from Bridlington to Redcar. Like *Pecten opercularis*, it is probably an inhabitant of the deep sea, which comes in towards the shore to breed. *Ocinebra* is not a common shell on the Yorkshire coast, but appears to be rather more frequent in the south, about Hornsea, than in the north. The young occur, but seldom, in ' shell sand.' *Cultellus pellucidus* was also a very young specimen about one-third of an inch in length.—F. H. Woods, Bainton.

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HYMENOPTERA, etc.

Hymenoptera, etc., at Tebay.—The following is a list of the Aculeate Hymenoptera, etc., captured or seen during the Tebay excursion of the Yorkshire Naturalists' Union, the most interesting capture was that of a dipteron—*Sericomyia borealis. Formica fusca* L. (W. Y.), *Myrmica rubra* L. (W.Y.), *Odynerus trimarginatus* Zett. W., *O. parietinus* L., *Vespa vulgaris* L. (W. and Y.), *V. sylvestris* Scop. (W.), *V. norvegica* Fab. (W. and Y.), *Halictus rubicundus* Chr. (W. and Y.), *H. cylindricus*, Fab. W., *Psithyrus vestalis* Fourc (W. & Y.), *Bombus agrorum* Fab. (W. and Y.), *B. lapponicus* Fab. (Cautley Spout, one), *B. pratorum* L. (W. and Y.), *B. terrestris* L. (W. and Y.).

All the specimens were collected on the left-side of the river Lune, between Tebay and Lon Gill, *B. lapponicus* excepted.

On July 6th I captured a fine male *Sericomyia borealis* Fln. on a head of Knapseed near Boroughbridge.

Among Silurian débris near Tebay, I was delighted to find cocoons of a species of *Osmia*.—Rosse Butterfield.

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* W. = Westmorland ; Y. = Yorkshire.

MOSSES.

Mosses at Tebay.—On the occasion of the Yorkshire Naturalists' Union Excursion to Tebay, Mr. Bellerby and I confined our attention to Tebay Gill and Tebay Gorge, with the exception of a hurried visit to Orton Scar. The following list of mosses, therefore, refers to Westmorland :—

Andreæa petrophila Ehrb.
Oligotrichum hercynicum Lam.
Diphyscium foliosum Mohr.
Seligeria recurvata B. and S.
Dicranella squarrosa Schp.
Campylopus atrovirens De Not.
Grimmia Doniana Sm.
Rhacomitrium aciculare Brid.
R. fasciculare Brid.
R. lanuginosum Brid.
Rhacomitrium canescens Brid.
Bartramia ithyphylla Brid.
Breutelia arcuata Schp.
Webera elongata Schwæg.
Plagiobryum Zierii Lindb.
Antitrichia curtipendula Brid.
Campothecium lutescens B. and S.
Eurhynchium myosuroides Schp.
Hylocomium rugosum De Not.

F. Haxby.

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VERMES.

***Cucullanus globosus* in the Derwent.**—In May 1912, I took from the stomach of a trout caught in the Derwent, at Forge Valley, a bright, coral-red parasitic worm, 3⅛ inches in length. In the following month I found another similar specimen in the stomach of a trout caught in the Derwent near Hackness, the colouring in this individual not being quite so brilliant. I sent these to Prof. Nuttall, of Cambridge, who in turn submitted them to Dr. A. E. Shipley, who states that the worm is *Cucullanus globosus*, a very rare species. An account of these worms will, I believe, appear in the Journal of Parasitology.—Wm. J. Clarke, F.Z.S., Scarborough.

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Enemies of the Garden. In connection with the interest now being taken in schools with regard to nature study, we are pleased to find that Messrs. A. Brown and Sons, have issued a series of large wall diagrams (24 inches by 19 inches) prepared from special designs by the Rev. H. W. Brutzer, F.E.S. The diagrams consist of the following :—(1) Outline of Insect Life. Hymenoptera, Coleoptera, Lepidoptera, details. (2) Lackey Moth.—Egg, Caterpillar, Nest, Cocoons, Female Lackey Moth, Egg Cluster. (3) Small Ermine Moth.—Eggs, Caterpillar, Cocoons, Ermine Moth, Nest in Apple Tree. (4) Gooseberry Sawfly.—Egg, Larva, Larva (last stage), Leaf, Sawfly, Branch, Cocoon. (5) Asparagus Beetle.—Eggs, Larva, Beetle, Pupa, Asparagus stripped of leaves, Cocoon. (6) Black Currant Mite. Mite, Big Bud on Branch, Section of Bud with Mites. (7) Raspberry Stem Bud Caterpillar.—Caterpillar, Chrysalis, Moth (enlarged), Raspberry Cane. (8) Millipedes and Centipedes.—Three destructive Millipedes and two useful Centipedes. (9) Scale.—Currant Scale, Scale on Aralia and Myrtle Leaves and Mussel Scale. (10) Wireworms.—Click Beetle and Skip Jack showing details. (11) Pea Thrips, Cockchafer, Daddy Longlegs, Woodlouse and Earwig, showing sections and details. (12) Some useful Insects.—Dragon Fly, Ichneumon Fly, Lady Bird, Tiger Beetle, Hover Fly, Glow Worm, Cocktail Beetle, Lacewing Fly. The diagrams are sold at 15s. the set, including a descriptive handbook, which may be had separately at the price of threepence. By the kindness of the publishers we are able to present our readers with reduced facsimiles of two of the diagrams. (Plates XVI. and XVII.).

ARACHNIDA AT TEBAY.

W. P. WINTER, B.Sc.,
Shipley.

In spite of the bad weather a good deal of collecting was done on the Yorkshire Naturalists' Union excursion to Tebay, and I have to thank Messrs. Rosse Butterfield, T. Stringer, Cuthbert Hastings and others for their help in bringing specimens to my notice. On Friday, August 2nd. the Lune Valley was examined from Tebay to How Gill. The two banks are in Westmorland until we reach How Gill from the stream in which the left bank is part of Yorkshire. Most of the Westmorland collecting was done in this Gorge or in Tebay Gill.

On Saturday, Cautley was explored. In the evening of Monday and the morning of Tuesday, the Lune Gorge was again visited, and on the latter occasion the foot of How Gill, on the Yorkshire side, was carefully worked.

At Cautley Spout it was noticeable that *Drassus lapidosus* (Walck.) was not uncommon under stones up to a considerable altitude, though it is by no means common in most of Airedale.

In several places a large mite (identified by Dr. George as *Rhyncolophus communis*) was found in abundance on the lichen *Parmelia saxatilis*. These ran very fast when disturbed, but although careful search was made no definite cause of their collecting together could be discovered. The same mite has been found since then all over the areas of Airedale and Wharfedale.

In the spiders a notable absentee was *Phyllonethis lineata* Clerck. Neither the type nor the variety *redimita* was found, but this may be explained by the fact that very little search was made in the hedgerows and bushes in which it usually occurs. In a number of cases (*e.g. Drassus, Clubiona, Coelotes, etc.*), the young spiders had not long hatched and numerous females of *Lycosa* were carrying their young on their backs.

In the following lists the separation between the counties has been made. The names marked with an asterisk are those of specimens collected in 1909 in Rawthey Valley and sent to me by Mr. Booth. I have included these to make the list as complete as possible. The spiders collected at the time of the excursion number 49, the harvestmen five, with one false scorpion and two mites, a total of 57 arachnids, the most noteworthy being *P. listeri* Sund. and *Clubiona diversa* Camb.

WESTMORLAND AND YORKSHIRE.

Amaurobius fenestralis (Strœm) ♀. Common.*

Coelotes atropos (Walck) ♀, ♂. Common.*

Tegenaria derhamii (Scop) ♀.

Leptyphantes blackwallii (Kulcz) ♀, ♂. Common.*

L. terricola (C.L.K.) ♂. Cautley.

Poeciloneta globosa (Wid.) ♀, ♂.
Micryphantes ruvestris (C.L.K.) ♀, ♂. How Gill.
Pachygnatha degeerii (Sund.) ♀, ♂. How Gill.*
Meta segmentata (Clerck) ♀, ♂.
Zilla x-notata (Clerck). ♀. How Gill.
Tarentula pulverulenta (Clerck) ♀. How Gill.
Lycosa amentata (Clerck) ♀. Common.
L. pullata (Clerck) ♀, ♂. Common.

PHALANGIDEA.

Oligolophus morio (Fabr.)
O. alpinus (Herbst).
O. agrestis (Meade).
Nemastoma lugubre (O.F.M.) *.

PSEUDOSCORPIONS.

Obisium muscorum (Leach).

MITES.

Rhyncolophus communis.

WESTMORLAND ONLY.

(Mostly from the valley of the Lune).

Oonops pulcher (Templ.) ♂. Borough Bridge).
Clubiona reclusa (Cambr.) ♀
C. diversa (Camb.) ♀.
Cryphoeca silvicola(C.L.K.) ♀
Robertus lividus (Bl.) ♀.
Tapinopa longidens (Wid.) ♀
Bolyphantes alticeps (Sund.) ♀.
Stemonyphantes lineata (Linn.) ♀, ♂.
Linyphia insignis (Bl.) ♀, ♂.
L. triangularis (Clerck.), ♀, ♂.
L. clathrata (Sund.) ♀.
Labulla thoracica (Wid.) ♀.
Leptyphantes minutus (Bl.) ♀. (Tebay Gill.)
Bathyphantes concolor (Wid.) ♀.
B. nigrinus (Westr.) ♀, ♂.
Œdothorax fuscus (Bl.) ♂.
Neriene rubens (Bl). ♀, ♂.
N. rubella (Bl.) ♂.
Dismodicus bifrons (Bl.) ♀.
Diplocephalus fuscipes (Bl.) ♀.
Pachygnatha clerckii (Sund.) ♀.
P. listeri (Sund.) ♀.
Meta merianae (Scop.) ♂.
Epeira diadematа (Clerck.) ♀.
Trochosa terricola (Thor.) ♀.
Salticus scenicus (Clerck) ♀.

PHALANGIDEA.

Liobunum rotundum (Latr.)
Phalangium opilio (Linn.)

MITES.

Ritteria nemorum.

YORKSHIRE ONLY.

Segestria senoculata (Linn.) ♀. Cautley.*
Drassus lapidosus (Walck.) ♀. Cautley.
Textrix denticulata (Oliv.).*
Bolyphantes luteolus (Bl.) ♀, ♂. Cautley, How Gill.
Linyphia montana (Clerck).*
Agyneta conigera (Cambr.). ♀. How Gill.
Lophomma herbigradum (Bl.) ♀. Cautley and How Gill.
Pirata piraticus (Clerck.) ♀, ♂. How Gill.
Lycosa nigriceps (Thor.) ♀. Cautley.
L. palustris (Linn.) ♀. Cautley.

PHALANGIDEA.

Megabunus insignis (Meade).*
Oligolophus tridens (C. Koch.).*

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Part XV. of **The Bradford Antiquary** contains one or two papers of interest to readers of *The Naturalist*. Dr. Villey describes the Roman site at Kirk Sink, Gargrave, near Skipton, and the Ancient Slag Heaps on Rumbolds Moor, though the conclusions in the latter are particularly indefinite. Mr. Preston describes an ancient stone cross on Riva Hill. There is a curious note from the Thornton Churchwardens' accounts for 1821 :—'It is agreed by the Consent of the Wardens together with Mr. Bishop as Master that John Drake seenor shall hould the office as Beegel or Dogwhipper so long as he sholl be able and to the satisfaction of the minester and the Inhabetants of the Chaplry of Thornton.'

SECOND SUPPLEMENT TO THE FLORA OF DEWSBURY AND DISTRICT.

By the Late P. FOX LEE.

(*Continued from page 289*).

691. V. LUTEA L. Calder bank, Mirfield.

694. V. PANNONICA Crantz. Waste ground, Mirfield.

695. V. MELANOPS Sibth. and Sm. Waste ground, by Hirst's old Malt-kiln, Mirfield.

699. V. AMPHICARPA Dorthes. Waste ground, by Hirst's old Malt-kiln, Mirfield.

701. V. PEREGRINA L. Calder bank, Mirfield.

715. LATHYRUS ANGULATUS L. Waste ground, Mirfield.

721. L. CICERA L. Waste ground, corn mill, Mirfield.

726. L. APHACA L. Manure heap, Batley ; waste ground, Mirfield.

1103. CARUM CARUI L. Caraway. Waste place by Corn-mill, Shepley Bridge.

1157. CORIANDRUM SATIVUM L. Waste ground, Shepley Bridge.

1166. CAUCALIS DAUCOIDES L. Corn mill, waste ground. (H. Parkinson).

1169b. C. NODOSA var. PEDUNCULATA. Malt-kiln, waste ground, Mirfield.

1171. C. LATIFOLIA L. Waste ground, Shepley Bridge (H. Parkinson).

1210. ASPERULA ARVENSIS L. Waste grain ground, Mirfield.

1233. CEPHALARIA SYRIACA Schrad. Old lime kilns, Mirfield (Messrs. Buckley and Jessop).

1288. PARTHENIUM HYSTEROPHORUS L. Waste ground by old corn mill, Mirfield (Messrs. Buckley and Jessop).

1299. HELIANTHUS DECAPITATUS L. Waste ground, Shepley Bridge.

1322. TAGETES MICRANTHA Cav. Calder bank, Ledgard Bridge, Mirfield (Messrs. Buckley and Jessop).

1324. ANACYCLUS RADIATUS Lois. Waste ground, Mirfield.

1340. ANTHEMIS ALTISSIMA L. Old cornmill, Mirfield (Messrs. F. Buckley and A. Jessop).

1344. A. RUTHENICA Biel. Waste ground, Shepley Bridge.

1364. COTULA AUREA Loefl. Waste ground, corn mill and Calder bank, Mirfield.

1410. CALENDULA OFFICINALIS L. Waste ground, Mirfield.

1422. CARDUUS NUTANS L. (Near) Corn mill, waste place, Shepley Bridge.

1432. Cirsium oleraceum Scop. Calder bank, Ledgard Bridge, Mirfield (Messrs. H. Wright and P. F. Lee).

1469. Centaurea napifolia L. Sutcliffe's corn mill, waste ground, Mirfield.

1476. Carthamus lanatus L. By old cornmill, Mirfield (Messrs. Buckley and Jessop).

1478. Scolymus hispanicus L. Waste place on bank of river Calder, Mirfield (H. Wright and P. F. Lee).

1799. Anchusa undulata L. By old corn mill, Mirfield (Messrs. Buckley and Jessop).

1803. Anchusa stylosa Bieb. Waste place, cornmill, Mirfield.

1846. Solanum nigrum L. Field corner, Mirfield and Cooper Bridge (H. Parkinson).

2014. Satureia (Calamintha) graveolens Carnel. By Hirst's corn mill, Mirfield. There is some doubt about this name (F. A. Lees).

2029. Salvia horminum L. Corn screening ground, Mirfield.

2039. Dracocephalum parviflorum Nutt. By Hirst's old Malting Mill, Mirfield.

2048. Sideritis montana L. Waste ground by Malting Mill, Mirfield (Messrs. Buckley and Jessop).

2067. Wiedemannia orientalis Fisch. & Mey. Calder bank, Mirfield (Messrs. Buckley and Jessop); Sutcliffe's corn mill, waste ground, Mirfield (F. W. Whitaker and P. F. Lee).

2095. Plantago lagopus L. Corn screening ground, Mirfield.

2123. Chenopodium opulifolium Schrad. On mill waste ground, Batley and Mirfield.

2185 ? Polygonum arenarium W.K. An elegant plant. Probably a grain casual. Calder bank, Shepley Bridge (H. Parkinson).

2251. Urtica pilulifera L. Roman nettle. An introduction with foreign barley. By Malt-kiln, Mirfield (H. Parkinson).

2652. Phalaris brachystachys Link. and

2654b. P. paradoxa var. praemorsa Coss. and Dur. Waste ground, Malt-kiln, Mirfield.

2658. Anthoxanthum aristatum Boiss. 'A rare casual brought with foreign fleeces presumptively; the triple-awned glume renders it liable to play the part of a burr' (F. A. Lees). On wool-waste out-thrown in Caulmswood, Dewsbury: a wood, alas! no longer, but at one time a pretty place. Not in "Dunn's Alien Flora."

2677. Phleum phleoides Simonk. (*P. boehmeri* Wit). Seed-alien. Waste ground, Mirfield.

2844 (sub). Triticum monococcum Willd. (*T. æstivum*, race of). Wool waste heap, Dewsbury.

2803. Bromus unioloides H.B. & K. On wool refuse, Dewsbury; on woollen mill refuse, Batley. 'A grass of very wide distribution in tropical, sub-tropical, and even temperate regions, having been long used as a fodder crop. As such its seed has been recently on sale in Britain. Its few records as sub-spontaneous point, however, rather to its importation with foreign grain' (Dunn's 'Alien Flora,' p. 192). 'I find it most frequent about fellmongery factories where fleeces have been scoured.' (F. A. Lees).

(6). Aliens with Woools—on Wool-waste heaps near Mills.

240. Lepidium ruderale L. On wool-waste places by mills.

282. Reseda phyteuma L. Calder bank, Dewsbury.

454. Malva pusilla With. Roadside, Mirfield.

456. M. parviflora L. Manure heap, Batley.

457. M. Ægyptia L. Waste ground, Mirfield.

496. Erodium ciconium Willd. Waste ground, Mirfield.

497e. E. cicutarium var. chœrophyllum (Cav.). Woollen-rubbish heap, Batley Carr.

499. E. cygnorum Nees. A pretty alien. Wool-waste heap, Batley Carr.

549. Trigonella gladiata Stev. The Sword Fenugreek. Manure-heap, Batley; waste ground, Mirfield.

551. T. monspeliaca L., and

552. T. corniculata L. Manure heap, Mirfield.

566. Medicago orbicularis All. By Malt-kiln, Mirfield (Messrs. Buckley and Jessop).

580. M. arabica Huds. (*M. maculata Sibth.*). Colonist. Frequent in places where wool-waste has been tipped.

590. Melilotus messanensis All. Wool-manure heap, Batley. 'Native of damp ground in the Mediterranean region, becoming a weed on cultivated ground there and in the East' (Dunn's 'Alien Flora,' p. 61).

1045. Lythrum hyssopifolia L. Casual. Burgh Fields, Ravensthorpe (H. Parkinson).

1101. Ammi majus L. Waste place by Malting Mill, Mirfield.

1102. A. visnaga Lam. The Fennel Carrot. A handsome S. European Umbellifer. Wool-waste heap, Batley. 'A native of sandy ground in the Eastern Mediterranean region' (Dunn's 'Alien Flora,' p. 82).

1291. Ambrosia artemisifolia L. Wool refuse heap, Batley.

1292. A. TRIFIDA L. Waste ground, West Mills, Mirfield (Messrs. Buckley and Jessop) ; Shepley Bridge.

1312. GALINSOGA PARVIFLORA Cav. Wool-waste heap, Batley. 'Native of rough, marshy, and stony ground in Central and South America' (Dunn's 'Alien Flora,' p. 115).

1314. MADIA SATIVA Molina. By old corn mill, Mirfield (Messrs. Buckley and Jessop).

1465. CENTAUREA CALCITRAPA L. On wool waste heap, Batley Carr.

1466. C. CALCITRAPOIDES L. Batley wool tips.

1467b. C. PALLESCENS Del. (perhaps) var. HYALOLEPIS Boiss. Batley wool tips.

1473. C. VERUTUM L. Waste places by corn mills, Mirfield. 'With peculiar decurrent leaves and yellow florets, the phyllarial spines like a javelin' (F. A. Lees).

1792*bis*. SYMPHYTUM ASPERRIMUM Donn. Calder bank, Dewsbury.

2110. AMARANTHUS RETROFLEXUS L. Wool-waste heap, Batley.

2122 CHENOPODIUM MURALE L. Shoddy manure heap, Batley.

2639. SETARIA VIRIDIS Beauv. Waste ground by woollen mill, Calder bank, Mirfield.

One of the earliest colonising grasses, doubtless a legacy of Trade, but in light soils now perfectly denizened in 34 or 35 County divisions, and be it remembered from 200 to 100 years ago some dozens of species *now* accepted as *of* our Flora, were in like case with *Setaria*, in the act of coming into their inheritance. How else, with so many gradual extinctions, should the ranks of Britain's floral forces be maintained ? (F. A. Lees).

2640. SETARIA GLAUCA Beauv. Casual on wool-waste Dewsbury.

2690. POLYPOGON MONSPELIENSE Desf. Beard-grass. On old sunken boat, Dirtcar side of river Calder, near Horbury (W. Rushforth) ; wool-waste heap, Dewsbury. An introduction with wool, generally. Native on the S. E. Coasts ; Norfolk, Essex, Kent, Hants., where it is a rare grass, 'But extending its range,' Mr. Lees adds.

2797. BROMUS TECTORUM L. Waste ground by corn mill, Shepley Bridge.

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Hull Museum Publication, No. 86, contains an illustrated note on a new fossil fish from Barton, 'An Old Hull Whaler,' 'Spurn and Justinian Angell,' and an illustrated account of the opening of the new museum of Fisheries and Shipping at Pickering Park. It is sold at one penny.

THE SPIDERS OF WICKEN, CAMBRIDGE.

WM. FALCONER.
Slaithwaite, Huddersfield.

(Plate XV.).

Only a few scattered fragments of that great marshland which once covered so large an area of the counties of Lincoln, Huntingdon, Cambridge, and Norfolk, can now be found in an aboriginal condition. The best known of these remnants of virgin fen is at Wicken. Portions of it have been acquired from time to time and formed into reservations in which it is hoped that the interesting fauna and flora characteristic of the fenland will find a permanent sanctuary and be saved from that extinction which threatened so many species a few years ago when it was proposed to drain the fen and bring it under cultivation. The moist conditions which are natural to the fen are favourable to the production of a superabundance of the lower forms of life, which constitute a never failing source of a plentiful food supply for a great number of small predaceous animals which act as effective agents in keeping their prolificness within due bounds. That these hosts of minute creatures in all stages of development are able to survive the periodical inundations to the depth of from two to four feet (the tops of the tall reeds and short willows alone showing above the water) which occur during the winter months, indicate marvellous powers of adaptation in structure and habits to apparently very adverse conditions.

Although so long and regularly resorted to by naturalists, the fen has not yet been systematically worked for its Arachnida. Mr. W. Farren collected spiders there in the early part of 1869, Mr. F. O. P. Cambridge in 1889, and Mr. C. Warburton in 1892, and workers in other branches of natural history have occasionally bottled conspicuous and obtrusive examples and forwarded them for identification to the Rev. O. Pickard Cambridge, who has noted sixteen of them in the ' Trans. Linn. Soc.' Vols. xxvii and xxviii, and in various annual parts of the ' Proceedings of the Dorset Field Club.' From the quality of these records it seemed certain that the fen in time would become as famous for rare spiders as it is already for rare plants, birds and insects. This view was fully borne out by the results of investigations made by myself from May 25th to 28th, and by Dr. A. Randell Jackson from June 5th to 12th of the present year. Together we met with 100 different species amongst which were several rare British spiders not previously reported from the locality, notably *Crustulina sticta* Camb., *Taranucnus setosus* Camb., *Lophomma subæquale* Westr., *Entelecara trifrons* Camb., *Tetragnatha nigrita* Lendl., *Trochosa spinipalpis* F. O. B. Cb., and *Sitticus caricis*

Westr. Two others, *Zora letifera* and *Neon valentulus*, are new to science, and a third, *Maso gallica* Sim., new to Britain. We failed to obtain seven species already recorded, viz., *Drassus pubescens* Thor., *Theridion blackwallii* Camb., *Leptyphantes minutus* Bl., *Phaulothrix hardii* Bl., *Mengea warburtonii* Camb., *Baryphyma pratensis* Bl., and *Evarcha arcuata* Clerck., but they have been added to the following list making a total of 107 species. These, with the exceptions noted in loco, were taken in the fen itself, either by sweeping or beating the vegetation, shaking the thick tufts of grass and sedge, or sifting the vegetable débris on the ground and the heaps of cut herbage which lie undisturbed for months together and become the chosen refuge of a multitude of all kinds of creatures. Individual spiders of the larger kinds have learnt to ascend the lepidopterists' artificial posts to prey upon the moths attracted by the sugar. Examples of *Epeira cornuta* Clerck., two males, *Clubiona holosericea* Degeer., two females, *Tibellus maritimus* Menge., one female, and *Xysticus ulmi* Hahn., one female, were so found one evening, when I accompanied Mr. B. Williams of London, on his round.

My best thanks are due to Dr. Jackson for so generously allowing me the use of his material and notes, and to the Rev. O. Pickard Cambridge, and Mons. E. Simon, to whom one or two of the more critical species were submitted.

Where no initials occur in the following list, it is to be understood that the species was obtained both by Dr. Jackson and myself. For convenience also I have named the lepidopterists' drove the Drove, and the grassy road bordered on both sides with trees which runs alongside the fen, the Drive.

ARANEAE.

Harpactes hombergii Scop. Three females from ivy covered gateposts in the Drive, W. F.

Drassus pubescens Thor. Proc. Dorset Field Club, Vol. xxvi, 1905, p. 42, Mr. F. P. Smith. A widely distributed but infrequent spider.

Scotophæus blackwallii Thor. An adult female from stables in the village, A. R. J.; another from a wall in the village, handed to me by Mr. Stallman, of London.

Prosthesima latreillei C. L. Koch. An adult female, A. R. J.; an immature female from heap of cut herbage in the Drove. W.F. Neither this species nor *S. blackwallii* are common, although widely distributed.

Micaria pulicaria Sund. One adult male with the last named. W.F.

Clubiona grisea, L. Koch. both sexes, not uncommon.

C. lutescens Westr. Both sexes from the fen and ivy covered gateposts in the Drive.

C. neglecta Camb. An adult female from the Drove. W.F. A scarce spider but widely distributed.

C. holosericea Degeer. Both sexes common.

C. pallidula Clerck. Both sexes in the same situations as *C. lutescens.*

C. subtilis L. Koch. Trans. Linn. Soc., Vol. XXVII., p. 414, taken in the fen in great numbers by Mr. W. Farren, in 1869. It occurred also plentifully at the time of our visit. A sou hern species but on record also for Spurn Point, Yorkshire and near Edinburgh.

C. comta C. L. Koch. One female, the Drive, W.F.

Zora letifera. sp. nov. figs. 1, 2, 3, 4. While collecting in the fen adult and immature examples of both sexes of a lighter coloured and less strongly marked *Zora* than usual came under my notice. On submitting them to microscopical examination, they were found to differ in several specific details from other members of the genus. I concluded therefore they were of a new species. Other examples were subsequently taken by Dr. Jackson who formed the same opinion and forwarded specimens to the Rev. O. Pickard Cambridge, who concurs in the view taken of them. I therefore describe and figure it postea page 317 as a sp. nov. under the above name.

Dictyna uncinata Westr. Both sexes on the bushes at the entrance to th e Drove and along the Drive.

Amaurobius similis Bl. In a wall in the village, W.F.

Textrix denticulata Oliv. Several females from ivy covered gateposts in the Drive, W.F.

Antistea elegans C. L. Koch. Several adult and immature females from various parts of the fen.

Episinus truncatus Walck. An adult male, A.R.J.; an im mature male, W.F.

Theridion denticulatum Walck. Three females from tree trunks in the Drive, W.F.

T. varians Hahn. A female from the lane leading to the fen, A.R.J.; several of the same sex from overhanging ivy in the village, W.F.

T. bimaculatum Linn. Many males and females from both sides of the Drove.

T. pallens Bl. A few females from branches of a tree near the village, W.F.

T. blackwallii Camb. Trans Linn. Soc. Vol. XXVII., p. 419, plate 55 no. 16, Mr. W. Farren, an adult male, Feb. 1869—the type specimen. A rare British spider which has been met with at Cambridge, Oxford, Richmond Park (Surrey), in Durham and Northants.

Phyllonethis lineata Linn. The Drove and the Drive.

Steatoda bipunctata Linn. Several immature males from stables in the village, A.R.J.

Crustulina sticta Camb. (figs 21-22). Eight males and several females in various parts of the fen. A local spider but occurring in several widely separated localities in the south of England.

Robertus arundineti Camb. One male. A.R.J.; one female. W.F. A rare British spider which has occurred in Dorset, Kent, Yorkshire, Northumberland, Cumberland, at Paisley and Forres in Scotland, and in the Isle of Man.

R. lividus Bl. An adult male from the Drove. W.F.

Linyphia montana Clerck. Both sexes on the bushes along the Drive. W.F.

L. clathrata Sund. Females on both sides of the Drove.

Taranucnus setosus Camb. A few females amongst long herbage. A.R.J.; three males. W.F. A very rare British spider, on record for Dorset, Northumberland, Newtown Moss (Penrith) and Cheshire.

Leptyphantes leprosus Ohl. A male from stables in the village. A.R.J.

L. minutus Bl. Trans Linn. Soc. Vol. XXVII, p. 428. An adult male, Mr. W. Farren, Feb., 1869.—sub. *Linyphia cingulipes* Camb.

L. tenuis Bl. Two males, one female from haystack between Wicken and Soham. A.R.J.

L. ericæus Bl. Females from both sides of the Drove.

Bathyphantes concolor Wid. One male. A.R.J.

B. pullatus Camb. Trans. Linn. Soc. Vol. XXVIII, p. 446. Several very young examples, Mr. W. Farren, sub. *Linyphia crucifera* Bl. The type of this variety also came from this locality. Several males and females from various parts of the fen.

B. parvulus Westr. A few males amongst herbage in the fen.

B. dorsalis Wid. Both sexes on the bushes in the Drove and along the Drive.

Porrhomma microphthalmum Camb. An adult male from an outhouse in the village. W.F.

Mengea warburtonii Camb. Proc. Dors. Field Club, Vol. XVI, 1895, p. 107. An adult female, Mr. C. Warburton. A rare British spider on record for Southport, Penrith, Northumberland and Yorkshire.

Phaulothrix hardii Bl. Proc. Dors. Field Club, Vol XVII, p. 59, Mr. C. Warburton.

Agyneta conigera Camb. Many examples, both sexes, from various parts of the fen, especially in the heaps of cut herbage.

Maso gallica Sim figs. 17, 18, 19, 20. Both sexes of this little spider which is new to Britain occurred freely in the fen, in both an adult and immature state. It is a very distinct species and an interesting addition to the British indigenous arachnidal fauna. Specimens were submitted to the Rev. O.

Pickard Cambridge, and Mons. E. Simon, the latter of whom kindly confirmed my naming. Description, etc., postea p. 320.

Gongylidium rufipes Sund. Both sexes, the Drove and the Drive.

Œdothorax gibbosus Bl. } Both sexes from various parts
Œ. tuberosus Bl. } of the fen.

Œ. dentatus Wid. One male, two females on the left side of the Drove. W.F.

Gongylidiellum vivum Camb. Several of each sex. A.R.J. two females, the Drove, W.F.

G. murcidum Sim. Proc. Dors. F. Cinb, Vol. XVI, 1895, p. 105. An adult male, Mr. W. Farren, 1869. Eight males, six females from both sides of the Drove, W.F. A very rare British spider occurring also in the New Forest.

Tiso vagans Bl. One female swept from herbage. A.R.J. another from the right side of the Drove. W.F.

Erigone atra Bl. Male and female. A.R.J.

Lophomma punctatum Bl. Two females on the right side of the Drove. W.F.

L. subaequale Westr. One male, A.R.J. A rare British spider which is now on record for ten widely separated localities in the British Isles.

Dicymbium nigrum Bl. An adult pair on left side of the Drove, W.F.

Enidia cornuta Bl. A few of each sex in the hedge of the lane leading to the fen. A.R.J.

E. bituberculata Wid. Many males and females both sides of Drove.

Dismodicus bifrons Bl. In plenty, both sexes.

Entelecara erythropus Westr. One female, the Drive. W.F.

E. trifrons Camb. Swept from various parts and not rare.

E. omissa Camb. Proc. Dors. F. Club. Vol. XXIII, 1902, p. 33. Mr. W. Farren (probably in 1869). Plentiful in the fen both in an adult and immature form, especially in the heaps of cut herbage. Except in this one place, a very rare British spider.

Savignia frontata Bl. Both sexes from both sides of the Drove.

Araeoncus humilis Bl. One male, several females.

Pocadicnemis pumila Bl. Plentiful in the fen, both sexes.

Styloctetor penicillatus Westr. Two females, one from a tree trunk in the Drive and the other from a pear tree in the village. W.F.

Tapinocyba subitanea Camb. One male and females from stables in the village. A.R.J.

Baryphyma pratensis Bl. Trans. Linn. Soc. Vol. XXVII, p. 450, plate 57 no. 36. sub *Walckenaera meadii* Camb, an adult male and immature examples of both sexes, Mr. W.

Naturalist,

Farren, Febraury 1869. Proc. Dors. F. Club, Vol, XII, p. 94 sub. *W. pratensis* Bl., an adult male, Mr. F. O. P. Cambridge, 1889.

Widera antica Wid. One female in haystack betw.en Wicken and Soham. A.R.J.; another in the fen. W.F.

Walckenaera nudipalpis Westr. Three females. W.F.

Cornicularia unicornis Camb. Several females from both sides of the Drove.

Ero furcata Vill. Two females from near the top end of the fen. W.F.

E. cambridgii Kulcz. Several females from both sides of the Drove. British examples of this species were until the publication of Kulczynski's 'Fragmenta Arachnologica IX,' January 1911, pp. 61-2, plate B, figs. 79, 81, 82. confounded with *E. furcata* Vill. Since, however, it has been recognised in Dorset, New Forest, Cheshire, Yorkshire, Cumberland, and Northumberland.

Tetragnatha extensa Linn. One male swept from rushes. A.R.J.

T. solandrii Scop. Both sexes plentiful on bushes at the entrance to the Drove and along the Drive.

T. obtusa C. L. Koch. Both sexes beaten from bushes at the entrance to the Drove.

T. nigrita Lendl. Two males and some females in company with *T. obtusa*. A.R.J. A very rare British spider from one or two localities in the South of England.

Pachygnatha degeerii Sund. One or two females in the fen. A. R.J.

P. clerckii Sund. Females from various parts of the fen.

Meta segmentata Clerck. Females along the Drive. W.F.

Singa herii Hahn. Proc. Dors. F. Club. Vol. XIV. 1893, p. 160. First British record, Mr. C. Warburton, one adult male, July, 1892. Vol. XXXI, 1910, p. 61, another male, Mr. Warburton, 1900. One adult male swept from grass in the drove. A.R.J. There are, so far as I am aware, no other British records of this very rare spider.

Zilla x-notata Clerck. Buildings in the village. W.F.

Epeira cucurbitina Clerk. Both sexes plentiful on bushes at the entrance to the Drove and along the Drive.

E. umbratica Clerck. One female outside a window in the village. A.R.J.; many females on gates in the Drive, invisible during the day, hiding in cracks, but coming out in the dusk to ensnare their prey. W.F.

E. cornuta Clerck. Both sexes in the fen and along the Drive.

Xysticus ulmi Hahn. Trans. Linn. Soc. Vol. XXVII, p. 403. Immature male sub. *Thomisus Westwoodii* Camb., Mr. W. Farren, 1869. Proc. Dors. F. Club. Vol. XIV, 1893, p. 160,

one female, Mr. C. Warburton, July, 1892. Several males and females from various parts of the fen. On record for several widely separated localities chiefly in the South of England; also noted at Howth, in Ireland.

Oxyptila flexa Camb. Proc. Dors. F. Club. Vol. XVI, 1895, p. 118. One of each sex, Mr. W. Farren, but taken years before being recorded (1869). Both sexes adult and immature from various parts of fen. Not a common spider but widely distributed.

O. trux Bl. Both sexes, not rare in the fen.

Philodromus dispar Walck. A female in lane leading to fen, another in an outhouse in the village. A.R.J.; a third in the fen. W.F.

Philodromus cespiticolis Walck. On bushes at the entrance to the fen, both sexes.

Thanatus hirsutus Camb. Trans Linn. Soc. Vol. XXVIII, p. 438. Numerous examples, all immature, A.p. 1869, Mr. W. Farren. One female, A.R.J. A rare British spider, which has occurred in Dorset, Northumberland, Lincolnshire, and Newtown Moss (Penrith).

Tibellus maritimus Menge. Both sexes occur reely in the fen. Some years ago Professor Kulczynski expressed an opinion that we had two species in Britain confused under the name of *T. oblongus* Walck. This was proved to be the case by Dr. Jackson in the 'Lancashire Naturalist for April, 1911, p. 386.' The distribution of the more recently recognised species in this country is still to be worked out.

Pisaura mirabilis Clerck. One of each sex. A.R.J.

Pirata piraticus Clerck. From various parts of the fen.

P. latitans Bl. Females. A.R.J.

Trochosa spinipalpis F. O. P. Cb. One male, several females A.R.J.; two females. W.F. from both sides of the Drove. A very rare British spider on record for Dorset, Cumberland and Northumberland.

Lycosa amentata Clerck. Two or three females in the fen. A.R.J.

L. farrenii Camb. Trans. Linn. Soc., Vol. XXVII, p.395, plate 54, no. 2., Mr. Wm. Farren, February 1869, the type specimens. Both sexes frequent in the fen. A rare British spider, probably occurring in other fenland districts.

L. pullata Clerck. Three females near the village. W.F.

L. prativaga C. L. Koch. Both sexes frequent in the fen.

L. palustris Linn. One female, the Drove. A.R.J.

Salticus cingulatus Panz. A female on left side of Drove and another on a gatepost in the Drive. W.F.

Heliophanus flavipes C. L. Koch. One male in the fen. A.R.J.

Marpessa pomatia Walck. Reported several times from

the fen. Proc. Dorset F. Club., Vol. XII, p. 97, one female, Mr. F. O. P. Cambridge, 1889; Vol. XIV, 1893, p. 161, several adult males, Mr. C. Warburton, July, 1892; Vol. XXIII, 1902, one male, Mr. H. Donisthorpe, September 1900. It occurred numerously, spun up in the heads of *Arundo phragmitis*. A.R.J. more occasionally at large amongst vegetation on the ground. W.F. A very rare British spider, which has been met with also at Southport.

Neon valentulus sp. nov. figs. 9, 10, 11, 12. Numbers of adults of both sexes of this interesting little jumping spider were met with amongst and between the tufts of grass and sedge at the top end of the fen, more particularly on the right of the Drove, and less plentifully in the heaps of cut herbage. When alive it appeared purplish black in colour, which under microscopical examination by reflected light resolved itself into iridescent tints. This feature which was constant in the males was much less noticeable in some of the females. In the course of two or three weeks immersion in spirit, the iridescent effects gradually fade away but afterwards faintly return when the specimen is allowed to dry. Examples were subsequently submitted to the Rev. O. Pickard Cambridge and Mons. E. Simon. The latter stated it to be *Neon reticulatus* Bl. *forma obscura*, common in France. I can find no mention of this variety in print and I have seen no French specimen of it, but the Wicken examples, at all events, possess characters which justify their being regarded as quite distinct from the spider above-named. I therefore describe and figure it as a sp. nov. postea p. 321.

Euophrys frontalis Walck. An adult male and several immature females from various parts of the fen.

Sitticus caricus Westr. One female adult and several immature from the fen. A.R.J. A rare spider on record for Dorset, Hants., Wilts., Herts., Norfolk, Suffolk, and Cumberland; in most cases sub. *Dendryphantes hastatus* C. L. Koch.

Evarcha arcuata Clerck. Proc. Dorset Field Club., Vol. XXVI, 1905, p. 55, an adult male, Mr. F. P. Smith, sub. *Hasarius arcuatus* Clerck. A rare British spider on record for Dorset, Burnham Beeches, New Forest, Epping Forest, Wokingham and Hastings.

DESCRIPTION OF NEW SPECIES, Etc.

Zora letifera sp. nov. Figs. 1 to 4. Adult males, 2.9 to 3.3 mm.; adult females, 5.9 mm.

Male.

PALPUS, figs 1, 2, 3, pale yellow brown, with tarsal joint only slightly duller, thinly covered with shortish adpressed hairs. *Femur* with three dorsal spines in terminal half,

and one internal lateral apical spine. *Patella* 1-1 basal dorsal spines. *Tibia* with some longer hairs and bristles, and a few dorsal, lateral and inferior long, black, sinuous spines.

PATELLA, viewed from above, a little longer than wide, and very slightly enlarged upwards.

TIBIA, viewed from above, about the same length as the patella, but much slenderer, and less parallel-sided; provided at upper external angle with a strong straight apophysis (fig. 1, *a*), about as long as the width of the joint, directed forward, narrow at the base, but enlarged upwards, and then abruptly and obliquely contracted into a shortish, slender, black point. Other views of apophysis are given in figs 2, 3, *a*.

TARSUS wide, oval, convex; on the basal half of the external margin a wide vertical border, the edges of which converge upwards to a point (figs. 1, 3, *b*); apex with a cluster of short stout spines. *Palpal organs* dull yellow brown; *bulb* oval; a long reddish brown spine originates near its centre, and passing downwards encircles its base and inner sides (fig. 2, *c*); a little nearer the apex proceeds a long, compressed, stout, sinuous, shiny, reddish process, extending beyond the summit of the bulb, its black termination abruptly bent downwards and outwards in triangular form (figs. 2, 1, 3, *d*).

LEGS.—Yellow brown, with tibiae I. and II., wholly or nearly so, and metatarsi I. and II. extreme tips only, suffused dark brown. *Coxal brush* on the under surface of legs IV., composed of longer, finer, more erect and less black hairs than in *Z. spinimana*, and covering more of the surface.

FEMALE.

CEPHALOTHORAX clear yellow brown; dark marginal line fragmentary, indicated only by a few small linear marks which do not extend to the frontal angle. Two uneven-edged dark lateral longitudinal bands run backwards from the posterior central eyes, brown in colour with transverse oblique irregular blackish patches, slightly enlarged and divergent backwards, and much narrower than either the central or lateral pale bands; along the median line, a slender brown streak followed by a long narrow reddish strie.

OCULAR AREA inclined, suffused with black between and around the central eyes, but the *clypeus* clear along the lower margin.

EYES.—Eight in two rows, only slightly raised; posterior

row very strongly and anterior row very slightly, curved forwards.

Anterior eyes, centrals much larger than the laterals, and more separated from each other (interval rather less than a diameter) than each is from the adjacent lateral.

Posterior eyes equidistant, more than one diameter apart, the centrals slightly the larger, but visibly smaller than the anterior centrals.

Central eye space nearly as wide as long, and as wide in front as behind; without yellowish white pubescence.

CLYPEUS convex, a little wider than the diameter of an anterior central eye, its lower margin with a few long projecting incurved spinelike bristles.

The mouthparts, sternum and spinners present no deviation from generic characters.

FALCES with a brown longitudinal band at the base on the anterior face, and the Sternum with indistinct brown marginal spots opposite the coxae of the legs. These two parts together with the leg coxae and under abdomen pale yellow brown.

LEGS.—Order of length, 4. 1. 2. 3. moderately long and strong, clear yellow brown; all with long strong spines. The tips of the metatarsi alone suffused dark brown, the other portions of the legs being quite free from markings.

Tibiæ I. and II., with two rows beneath of 7-7 or 8-8 exceedingly long and strong (especially the posterior ones) raised prone spines; dorsal spines none.

Metatarsi I. and II., with two rows of 3.3 similar spines beneath.

Tibiae and Metatarsi III. and IV., with dorsal, lateral and inferior spines.

Tibiae IV., with three dorsal spines centrally placed in a longitudinal line.

Femora with dorsal and latero-dorsal spines and on the internal side an oblique line running to the apex of 7 or 8 long slender spines, diminishing in size and strength upwards. *Femora I.* with a very long strong erect spine in terminal half on anterior side.

Tarsi without spines, scopulae confined to extremity of joint; claws with fasciculated hairs.

ABDOMEN somewhat elongated, the greatest width in posterior half; clear yellow brown; the dorsal dark brown patches arranged in three longitudinal lines, the central one divided at its anterior end and enclosing a lanceolate pale strip, characteristic of the Zoræ, much less pronounced

and more discontinuous, the lines in consequence much less conspicuous. Similar patches occupy the sides, and much smaller, more scattered ones the ventral surface.

EPIGYNE a yellow brown plate, as wide as long, with a large round, whitish coloured depression, having in its hinder half two slender, reddish curved striae converging backwards. *Spermathecæ* at fore external angles, round, continued backwards by a curved tubular duct of nearly uniform width and only very slightly oblique. Fig. 4.

The females from which the above description was taken had just become adult, and it is possible that greater age might bring a somewhat increased deposit of pigment.

Z. letifera is closely allied to the commoner and more generally distributed *Z. spinimana* Sund. It is, however, a paler coloured, less richly marked, and for its size more slenderly built spider. In the males of the two species, there are in addition, well-marked differences in the palpi. In *Z. spinimana* Sund (figs. 5 to 7), the tarse and palpal organs are on a larger scale; the tibia is much stouter and shorter, and has a differently formed apophysis (marked *a*); the apical process of the palpal bulb (marked *d*) is longer, much slenderer, less sinuous laterally, and more gradually acuminate at the end. In the female of the same species, the formation of the epigyne is dissimilar, the central depression being smaller, and more ill-defined, the rounded head of the anterior *spermathecae* smaller, and the tubuler dnct larger, widening more or less posteriorly, and more obliquely placed. Fig. 8. The disproportion in bulk between the two divisions of the body is much less; both also wider in proportion to their length. The facies too, is quite different: the eyes are larger, less unequal, more strongly elevated, and the centrals of both rows much the same size; the ocular area is more vertical, and the middle part of it clothed with long yellowish white pubescence which is wanting in the new species.

***Maso gallica* Sim.** Les Arachnides de France. Tome 5, part 3, p. 862, sub. *M. sundevalli* Westr.

Amongst British spiders, the two species of Maso at present recorded for this country may be very easily differentiated by (1) their small size; (2) the two rows of long slender divergent spines beneath the tibiae and metatarsi of legs I. and II. (longer and stouter in the female); (3) the leg tarsi much shorter than the metatarsi; (4) the broadly truncated front of the cephalothorax; (5) the lateral eyes set on strong prominences; and (6) the absence in the male of any cephalic lobe or elevation and of postocular impressions.

The genus recognised, the characters most to be relied upon

to separate *M. gallica* Sim. and *M. sundevallii* Westr. are found in the genitalia of both sexes.

Maso gallica Sim. Figs. 17 to 20.

MALE. Fig. 17 and 18.

PALPUS. *Tibia* above with a shallow depression at apex, the external angle of which is rounded and the internal angle prolonged into a depressed, blunt, black-tipped apophysis, at the base of which are three club-shaped bristles.

Tarsus.—Base drawn out into a conical elevation on the top of which are three club-shaped bristles.

In *M. sundevallii* Westr. the palpal tarsus is not drawn out at the base, the tibia is not excavated, and has no apophysis, and the peculiar club-shaped bristles are entirely absent.

FEMALE.

EPIGYNE, figs. 19 and 20. A low semi-circular transverse projection, having on each side a black horny space, and in the middle a slender, shortish cylindrical process, somewhat raised and directed obliquely backwards.

In the epigyne of *M. sundevallii* Westr., this raised oblique process is wanting. If a comparison be made between the present drawings and the figures of the latter species given in *The Naturalist*, June 1910. p. 229, fig. 2, epigyne, fig. 3 male palpus, the distinction between both sexes of the two species will be clearly seen.

Neon valentulus sp. nov. Adult males 1.9 to 2.5 mm.; adult females 2.2 to 2.8 mm.

MALE.

CEPHALOTHORAX very obscure yellow brown, very strongly suffused with black towards the margins, especially in front, with darker radiating lines behind and on the sides, and a strong black marginal line; the front and sides of the caput with a black band dilated around the dorsal eyes, and marked with stronger and more bristly hairs on slightly raised bases. Tegument of the caput somewhat rugose.

EYES.—Those of the third row as large as the laterals of the first row, and as widely separated so that the dorsal eye quadrilateral is parallel-sided. *Face eyes* straight by summits, contiguous and surrounded by white hairs.

CLYPEUS narrower than the radius of a front central eye, blackish, with a cluster of a few long slender incurved bristly hairs projecting outwards from its centre.

FALCES short, slender, strongly suffused with black both on anterior and inferior surfaces, with obscure yellow brown oblong longitudinal streaks.

MAXILLAE, except on the inner margin and the LABIUM except on the anterior edge which are whitish, entirely suffused black.

STERNUM of a dusky hue, with a broad darker marginal border; its entire surface covered with numerous small round yellow brown spots.

PALPUS, figs. 9, 10, 11, black.

TIBIA, short and stout, enlarged at distal extremity, widely and shallowly excavated at anterior margin: no proper apophysis, but the external angle strongly and shortly produced, its apex slightly curved outwards, and ending in a point.

TARSUS oval, slightly hollowed on each side to receive the angular extremities of the tibia, with a distinct black border, longer than the tibia and patella; a lighter coloured patch near the extremity showing a number of small round dusky yellow brown spots, and covered with white hairs beyond which is a cluster of stronger black hairs.

PALPAL ORGANS, figs. 9 and 10, dusky brown, the greater part exserted from the tarse, and projecting backwards to the base of the tibia. *Bulb*, oval, its posterior extremity attenuated and rounded; near its summit a strong, very oblique transverse fold; close to the base of the tarse on the inner side springs a long black spine which extends in three wide curves to the very apex of the joint (figs. 9 and 11 (*a*); through its lowest curve, exserted considerably beyond the tarsal margin and very conspicuous when viewed from above, a prominent stout yellow-brown process slightly elevated at the upper external angle, and densely covered especially at apical margin with very short strong denticulae. (Figs 9, 10, 11*b*).

LEGS, order of length, 4, 1, 3, 2, Legs I a little thicker than the others. Femur I, slightly compressed and enlarged, with numerous long black curved bristles on its upper surface. Tibial and metatarsal spines, long and slender; tibiae, 3-3 beneath; metatarsi, 2-2 beneath. Contrary to Simon's characterisation of the genus in his Arachnides de France, Tome 3, p. 208, where the posterior legs are stated to be without spines, the metatarsi of III and IV are provided with spines but they are much shorter than those on I and II; met. III, with four apical spines, the two beneath stronger than the two above, met. IV, two beneath only, but more laterally placed. *N. reticulatus* Bl. has these spines also.

Every joint very extensively suffused with black, with yellow-brown oblong and linear patches on the large joints, small round spots on most of the joints and annulations of a similar colour at the articulations of the three terminal joints; the tips of tarsi I, very pale coloured.

ABDOMEN, oval, attenuated behind, broadly truncate in front where there are many long black bristly hairs; very obscure yellow-brown in anterior half, becoming black in posterior half and on central surface; unevenly covered with yellow-brown spots more irregular in shape and size, arranged on the sides in oblique longitudinal rows, and on the under abdomen in regular curved longitudinal lines, two on each side of the centre; *above* in the posterior half these spots form a number of transverse angular bars extending to the spinners, and in the posterior half four others larger than the rest form a quadrilateral. *Tegument* very strongly ridged, laterally and behind. *Spinners*, normal in disposition and structure, black.

EPIGYNAL AREA, as long as wide, the anterior part with two somewhat large, deep, round foveae, finely bordered, and separated by a narrow, smooth reddish keel; the posterior portion extending to the epigastric fold, forming a large, smooth, slightly convex yellow-brown space, scarcely, if at all, passing the lateral level of the foveae.

Most of the females resembled the male in general characteristics, but a few of them were larger than the rest, very much less suffused with black, and showed no irridescence, which cannot therefore be considered inherent in the species. *N. valentulus* in form and structure is very close to *N. reticulatus* Bl. Apart from colouration and iridescence, the validity of the new species will mainly depend on the importance to be attached to the curious sexual differences. In the male, the palpus is on a larger scale, the tibia more slightly robust and its angular projections stouter; the palpal organs more voluminous, the palpal spine (figs. 9 and 11*a*) very long, extending from the base to the apex of the tarsus; the transverse fold very oblique; the denticulated process (figs. 9, 10, 11, *b*.) projecting greatly beyond the tarsal border and very conspicuous from above. In *Neon reticulatus* Bl. the same parts are present but much reduced in size, somewhat differently shaped, and differently placed. The palpal spine (figs. 13, 15, *a*) a great deal shorter, curves slighter, originating below the middle of the tarsal border; the fold of the bulb directly transverse; the palpal process (figs. 13, 15, *b*), smaller and slender, situated at the summit of the palpal organs and completely hidden from above.

In the epigyne of *N. reticulatus* Bl., the foveae are smaller, the posterior space larger, and extending well beyond the

lateral level of the foveae, so that the epigynal area is wider than long (fig. 16).

Without exception, the males (and I took a great number) and the females (not so many) exhibited the sexual characteristics described above; I did not meet with a typical example of *N. reticulatus* Bl. or with intermediate forms.

REFERENCES TO PLATE.

(Pubescence omitted).

Zora letifera sp. nov.
- Fig. 1. Right palp of male from outside (*a*) tibial apophysis (*b*) tarsal border (*c*) palpal spine (*d*) apical process of palpal organs.
- Fig. 2. Left palp of male from below. Lettering as in fig. 1.
- Fig. 3. Right palp of male from above and a little to the outside (*a*) as in fig. 1.
- Fig. 4. Epigyne of female.

Zora spinimana Sund. Lettering as in previous species.
- Fig. 5. Left palp of male from outside.
- Fig. 6. Left palp of male from below.
- Fig. 7. Right palp from above and a little to the outside.
- Fig. 8. Epigyne of female.

Neon valentulus sp. nov.
- Fig. 9. Right palp of male from the inner side. (*a*) Palpal spine. (*b*) Palpal process.
- Fig. 10. Right palp of male from above and a little to the outside. (*b*) Palpal process.
- Fig. 11. Portion of male palp from below. Lettering as in fig 9.
- Fig. 12. Epigyne of female.

Neon reticulatus Bl. Lettering as in previous species.
- Figs. 13, 14, 15, 16, corresponding respectively to figs. 9, 10, 11, 12.

Maso gallica Sim.
- Fig. 17. Left palp of male from above. (*a*) Tibial apophysis.
- Fig. 18. Left palp of male from outside and a little below. (*a*) Tibial apophysis.
- Fig. 19. Epigyne of female from above.
- Fig. 20. Epigyne of female in profile.

Crustulina sticta Camb.
- Fig. 21. Left palp of male from outside.
- Fig. 22. Epigyne of female.

The Annual Report and Proceedings of the Belfast Naturalists' Field Club for 1911-12, contain an illustrated paper on Beekites, with a bibliography; the presidential address of Mr. R. J. Welch, on Sandhills, their Flora and Fauna; an account of the Kitchen-Middens in Dingle Bay, and other notes bearing upon the society's sphere of work.

No. 19 of the Journal and Transactions of the Leeds Astronomical Society for the year 1911, edited by Mr. Ellison Hawks (Leeds, R. Jackson and Son, 68 pages, 2s.) contain further evidence of the activity of this society. Among the contributions are papers bearing on the tides, the Nebulæ, observations for amateur astronomers, recent lunar observations, star movements, and mutual eclipses of the Satellites of Jupiter. These are by Messrs. Hardcastle, Gregg, Hawks, Wilson and Whitmell. There are also reprints of several contributions made by the members of the society to other journals.

YORKSHIRE NATURALISTS' UNION.

ANNUAL MEETING OF THE ENTOMOLOGICAL SECTION.

President:—H. H. CORBETT, M.R.C.S.

Two meetings will be held at the Leeds Institute, Cookridge Street, Leeds, at 3-30 p.m. and 6-15 p.m. respectively, on Saturday, October 26th, 1912.

BUSINESS (at the afternoon meeting) :—

To consider and pass the sectional reports for 1912, and to elect officers for 1913.

Exhibition of specimens. In addition to specimens of general interest, lepidopterists are especially requested to bring good series of *Hyberma aurantiaria* and *H. defoliaria*. Exhibitions of specimens of other orders of insects are invited.

At the evening meeting several short addresses on entomological topics will be contributed by the members.

All members and associates of the Yorkshire Naturalists' Union are invited to attend and to bring any notes made during the past season. In order that a correct and complete account of all exhibits may be included in the report, the Secretaries particularly request that each may be accompanied by a descriptive note.

Officials of affiliated societies are earnestly requested to notify their members.

SECRETARIES :—Lepidoptera, A. Whitaker and B. Morley; Hymenoptera, Hemiptera and Diptera, W. Denison Roebuck; Neuroptera, Orthoptera and Trichoptera, G. T. Porritt; Coleoptera, H. H. Corbett.

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THE NATURALIST

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RILEY FORTUNE, F.Z.S.

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YORKSHIRE NATURALISTS' UNION.

THE ANNUAL MEETING FOR THE SECTION OF VERTEBRATE ZOOLOGY.

President:—OXLEY GRABHAM, M.A., M.B.O.U.

Two Meetings will be held in Room C 7, at the Leeds Institute, Leeds, at 3-15 p.m. and 6-30 p.m. respectively, on Saturday, November 16th, 1912.

BUSINESS AT THE AFTERNOON MEETING:—

To consider and pass sectional reports for 1912, and to elect Officers for 1913:—

To consider and pass the General and Financial Reports of the Yorkshire Wild Birds' and Eggs' Protection Acts Committee, for 1912, and to elect the Officers and Committee for 1913.

To consider and pass the Report of the Yorkshire Mammals, Amphibians, Reptiles and Fishes Committee for 1912, and to elect this Committee for 1913.

Papers (mostly illustrated by lantern slides or specimens) will be read by the following gentlemen:—Afternoon—"Notes on the Cuckoo," Mr. W. H. Parkin, Shipley; Evening—"Home Life of the Peregrine Falcon," Dr. Francis Heatherley, F.R.C.S.; "Moorland Birds," Mr. E. Wilfred Taylor, York.

Any Member or Associate of the Y.N.U. is invited to attend, and to bring notes, specimens, lantern slides, etc., and is requested to bring forward matters of interest connected with the work of the section, and to take part in any discussion.

Will Officials of Affiliated Societies kindly notify their Members.

Please note change of Room.

Any further particulars from:—

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NOTES AND COMMENTS.

MR. HAROLD W. T. WAGER, F.R.S., F.L.S.

It is satisfactory to learn that Mr. Harold Wager, F.R.S., for many years a prominent supporter of the Yorkshire Naturalists' Union, is to be the Union's president for 1913. Formerly lecturer in Botany at the Yorkshire College, Mr. Wager naturally takes a principal interest in the plants, especially the lower forms. At the Annual Fungus Forays of the Yorkshire Naturalists' Union, he has frequently read papers and in other ways added to the success of these gatherings. Readers of *The Naturalist* are familiar with his work, which principally refers to the Cytology and Reproduction of the Lower Organisms, and the Teaching of Botany. At the South African Meeting of the British Association in 1905 he was President of the Botanical Section, and he has also occupied the presidential chairs of the British Mycological Society and the Leeds Naturalists' Club. In addition to being a Fellow of the Royal and Linnean Societies, he is a Fellow of the German Botanical Society. He is also a member of the Council of the Royal Society. His position as Inspector of Secondary Schools under the Board of Education necessarily makes him familiar with modern educational methods.

SIR CHARLES LYELL.

The accompanying excellent portrait of Sir Charles Lyell is taken from the menu of the dinner held by the Geological Section at the British Association at Dundee. The original was hung in the Dundee Art Gallery, by Sir Leonard Lyell, Bart., of Kinnordy, who has kindly given us permission to reproduce it (Plate XVIII.). The portrait was painted in 1870 by Lowes Dickenson, Charles Lyell being seventy-three at the time.

RED LION CUBS.

The Red Lion Cubs, as the geologists were styled, held one of the most successful Dinners that there have been for many years, and it was graced by an unusual number of foreign visitors who severally toasted the President (Dr. Peach) in various languages. It so happened that the dinner was held on the date the President was celebrating his seventieth birthday, and those who heard him sing the 'Song of the Seraphim,' in the chorus of which all the party joined, will not soon forget it. The song was specially written for the Red Lion Club Dinner held during the Dundee meeting in 1867, and was then sung by the author, Dr. Henry Woodward, to the tune of 'Bonny Dundee'. The 'Seraphim,' of course, is the

large fossil crustacean known as *Pterygotus*. The first two verses are as follows :—

To the Lairds of Creation, the ' Seraphim ' spoke
' Ere my *corpus* you get at there's stones to be broke '
Then each able member of our section C
Will steze up his hammer and straight follow me.

There's Powrie and Slimon to show us the way
To split up the shales, and recover the prey ;
And if you would wish the right quarry to see
Take train at 10-30 for Balruddery.

YORKSHIRE MAMMALS.

On Wednesday evening, the 16th Oct., a new gallery was opened at the Municipal Museum, Hull, which is to be entirely devoted to the exhibition of local mammals, The specimens include several historical examples from the collection of the late Sir Henry Boynton, and other sources, and a number of them are the last records of the kind for the district. The collection is arranged in specially made cases, in which the animals are shown in their natural surroundings, in addition to which there are several large groups showing the male, female, and their young, etc. The groups consist of Otters, Badgers, Hedgehogs, Deer, Foxes, etc. On the occasion, the Curator gave an address on the Mammals of the East Riding of Yorkshire.

STORY OF A GREAT ' DISCOVERY.'

In these columns we have more than once drawn attention to the fact that in the geological and archæological world things are not always what they seem. Usually a ' little knowledge ' has proved dangerous to its possessor. In the following case, however, which is taken from the *Daily Telegraph*, the ' discovery ' was made, and an interpretation thereof given by those who ought to have known better. But such things do occur by those who are in red-hot haste to get their ' find ' telegraphed and photographed for the daily press. ' The first example in Great Britain of prehistoric cave painting of the kind already familiar to palæontologists from the Caves of Dordogne, the South of France, the Pyrenees, and the peninsula of Spain, has recently been discovered on the walls of Bacon's Hole, near Mumbles, by Professor Breuill and Professor Sollas.' So reported the *Times* a few days ago. How these distinguished French archæologists lighted upon this momentous discovery was described vividly and with much detail. We were told how Professor Breuill, ' without exception the most distinguished investigator of Aurignacian deposits,' and Professor Sollas set out on an expedition to the Gower Coast in

search of Aurignacian relics, how they searched until at last only one cave remained to be investigated—the well-known and easily accessible Bacon's Hole, a few miles west of the Mumbles.

PREHISTORIC PAINTINGS ON CAVE WALLS.

The *Times* proceeded: 'On entering this, one of the investigators cried, "Les voila!" and the other "There they are." On the right-hand wall at about the level of the eyes may be seen—not a picture—but a number (ten) of horizontal bands, vivid red, arranged in a vertical series, about one yard in height.' On the following day the *Times* was moved to speculate, in a weighty and quite authoritative leading article, on the discovery, pardonably proud, of course, of its exclusive news scoop. 'The finders,' it said, 'are to be congratulated on the fit of enthusiasm which prompted their search. The discovery is a triumph for the "a priori" method of investigation.' 'When,' it was demanded, 'did the Aurignacian man, who smeared his red ochre on the walls of Bacon's Hole, live?' So much for the discovery with which the whole archæological world has been set agog.

EXPERTS' PICKWICKIAN TRIUMPH.

Now for the answer to the question. The 'prehistoric man' fondly conceived by the French experts lived not 18,000 years back—as Professor Sollas has estimated—but eighteen years. The *Cambria Daily Leader* explains how he came to smear his red ochre on the walls of Bacon's Hole. Eighteen years ago a Norwegian barque was driven ashore in the vicinity of Bacon's Hole, and a local boatman found among the wreckage a brush which had been used on the vessel for laying on a reddish paint. 'Too good to throw away,' the boatman remarked, and with the intention of rubbing the paint out of the brush, he forthwith proceeded to the side of the cave for the purpose. He left behind on the wall 'ten horizontal bands, vivid red, arranged in a vertical series.' Quite Pickwickian!

—:o:—

The extensive collection of East Yorkshire and North Lincolnshire diatoms, made by the late R. H. Philip, of Hull, also the specimens which have been figured and described in the well-known work by Mills and Philip, together with his microscope, a fine collection of microscopical slides (including several made by Robt. Harrison, a former Hull microscopist), and his scientific books, have been presented by Mrs. Philip and family to the Hull Museum. The collection of slides contains over 3,000 specimens, and among the books are such important works as "Diatomees Marines de France," by MM. H. et M. Peragallo; "A Treatise on the Diatomaceæ," by Van Heurck; "Diatomaceæ Germaniæ," by H. Von Schonfeldt; "British Desmidiaceæ," by W. West, and numerous other volumes dealing with microscopy.

THE SEXUALITY OF FUNGI.*

HAROLD WAGER, F.R.S.

THE varied phenomena of sexual fusion in the Fungi open up some extremely interesting problems concerning the significance of sex. During the last 25 years, the cyotlogical features of the nuclear fusions which take place in the Fungi have been very fully investigated, with the result that in certain forms, such as *Peronospora* and *Cystopus*, a very distinct sex differentiation obtains, which closely resembles that found in the higher organisms. In other groups, however, *Ascomycetes*, *Uredineae*, and *Basidiomycetes*, there is a modification of the sexual process resulting in the fusion of two nuclei which are found in one and the same cell, Ascus, Teleutospore, or Basidium. In the case of the teleutospore the two nuclei can be traced back through a long series of generations to the Aecidium, and here Blackman has found that the binucleate condition arises by the fusion of two cells. In the Ascomycetes, on the other hand, the two nuclei of the Ascus cannot be traced back in this way, but there is, in some forms, a previous fusion of two sexually differentiated cells. Whether these two fusions in the *Ascomycetes* are genetically connected is not known, but there is strong evidence to show that the first fusion is a process of degeneration and in some forms has entirely disappeared, leaving only the fusion in the Ascus. In the *Hymenomycetes* there is only one nuclear fusion, and this takes place in the basidium. This means that in this large group of the Fungi about 9000 species, there is no true sexual fusion and no blending of two lines of descent.

The well marked sexuality which exists in the lower groups of Fungi is, therefore, being replaced, in the higher groups, by a reduced or apogamous fertilization. What advantage or disadvantage this may be, we cannot say; we require more knowledge of the significance of sex in the higher organisms before we can attempt to answer the question, but it is an interesting fact that this autogamous fertilization should occur in a group in which there is an extraordinary amount of variation.

——: o :——

At the meeting of the Vertebrate Section of the Yorkshire Naturalists' Union to be held at the Leeds Institute on November 16th, Dr. Heatherley will deliver a lecture on 'The Life History of the Peregrine Falcon,' which will be illustrated by an exceptionally fine series of photographs. The birds referred to were watched continuously for some weeks without a break, so that there is a remarkably unbroken series of notes thereon. Several members of the Yorkshire Naturalists' Union took part in the observations.

* Abstract of Lecture delivered at the meeting of the Mycological Section of the Yorkshire Naturalists' Union at Sandsend, Sept. 28th to Oct. 3rd.

ON THE SNOUT OF A PACHYCHORMID FISH (*PROTOSPHYRÆNA STEBBINGI*) FROM THE LOWER CHALK OF S. FERRIBY, LINCOLNSHIRE.

A. SMITH WOODWARD, LL.D., F.R.S.,
British Museum.

(PLATE XIX.).

The Cretaceous ganoid fishes of the genus *Protosphyræna* mimic the existing sword-fishes in the outward form, and the numerous species are distinguished by the shape of the elongated snout.* Sometimes the snout is blunt (*P. brevirostris*), at other times slender (*P. tenuis*), but in nearly all cases it is more or less cylindrical or oval in section. Only in one described species does it form a slender flattened blade approaching that of the highest sword-fishes (*Xiphias*), and this has hitherto been known merely by two portions of a single specimen.

Protosphyræna stebbingi, as the species with the flattened blade is named, † was discovered a few years ago by Mr. W. P. D. Stebbing, F.G.S., in the Lower Chalk (zone of *Holaster subglobosus*) at Betchworth, Surrey. The parts recovered were only the basal portion and a terminal fragment of a snout. More recently, Mr. Thomas Sheppard, F.G.S., has obtained part of a second specimen from the same geological horizon at South Ferriby, Lincolnshire; and as this belongs to a snout about as large as the type, representing the part between the two pieces of the latter, it completes our knowledge of this interesting fossil in a very remarkable manner.

The new specimen is shown of the natural size from above (fig. 1), the right side (fig. 2),below (fig. 3), and in transverse sections (figs. *a*, *b*) in the accompanying plate. Combined with the type, it proves that the snout measured about 45 cm. in total length, which is somewhat greater than I originally estimated; and from the side view it is clear that the blade curved slightly upwards towards the end like the snout of the more normal species of *Protosphyræna*.

As shewn by the type already described, the upper surface of the base of the snout rises gently to the middle line, where it is traversed by a longitudinal groove, which has a flattened smooth floor and sharply-raised tuberculated edges. On either side of this prominent median feature the sloping surface is

* See especially A. S. Woodward, 'Catalogue of Fossil Fishes in the British Museum,' pt. iii. (1895), pp. 399-410.

† A. S. Woodward, 'Fossil Fishes of the English Chalk' (Mon. Pal. Soc,, 1909), p. 153, pl. xxxiii,, fig. 3.

ornamented by closely-arranged fine longitudinal ridges and rows of small bordered pittings. The new specimen (fig. 1) which must be placed a little further forwards than this basal piece, still exhibits the median longitudinal groove, but with less prominent edges and gradually becoming much less conspicuous; while the lateral sloping surfaces are again ornamented with closely-arranged fine longitudinal ridges, which are more or less irregular, often bifurcating, often intercalated, and usually bearing low tubercles. The rows of bordered pits on the basal piece evidently represent these tuberculated ridges of the middle part of the snout. In the terminal piece of the type specimen, the longitudinal median groove is only slightly marked, and the longitudinal ridges, which in this region are often reticulated or sub-divided into tubercles, extend over it. The sharply-rounded lateral edges in the proximal half of the snout are also marked with longitudinal ridges, which are rounded and smooth, at first inclined downwards and forwards and then, as shown by the new specimen (fig. 2) directed upwards again. The lateral edges in the distal half are smooth, but impressed with a few irregular shallow wrinkles. The lower surface of the new specimen (fig. 3), like that of the terminal piece of the type, is smooth, except quite at its proximal end where a few very small tubercles are irregularly scattered. It is also marked by the faint broad median longitudinal groove, and by a pair of lateral longitudinal lines.

From the same horizon and locality as the new specimen now described, Mr. Henry C. Drake, F.G.S., has also obtained a species of *Pachyrhizodus** and other fish-remains of much interest; while in a higher horizon he has discovered characteristic portions of *Elopopsis crassus*.†

EXPLANATION OF PLATE XIX.

Protosphyræna stebbingi A. S. Woodw.; portion of rostrum, nat. size, seen from above (1), the right side (2), and below (3), with two transverse sections in outline (*a*, *b*).—Lower Chalk (zone of *Holaster subglobosus*), South Ferriby, Lincolnshire. In Hull Museum.

We notice from the *Publishers' Circular* that Messrs. Longman are shortly to publish 'the only authorised edition of the address' of the president of the British Association, delivered at Dundee. From this it would appear that the copies of the address published and sold by the Association at Dundee, and the copy appearing in the Association's Annual Report, are not authorised!

* A. S. Woodward, *op. cit.* (Mon. Pal. Soc., 1912), p. 249, pl. liv., fig. 2.
† A. S. Woodward, *The Naturalist*, 1907, p. 306.

THE STRUCTURE OF A GARLIC BULB.

E. G. HIGHFIELD, B.Sc.

THE wild garlic or Ramsons (*Allium ursinum*) may, with advantage, be chosen by students of botany as a suitable plant in which to study the origin and structure of a bulb. It is very plentiful, and bulbs in all stages of development from germinating seeds upwards can easily be obtained in a wild state.

As compared with other bulbous plants, the garlic presents several distinctive characteristics, particularly in the simplicity of its parts, and the rapidity with which the bulb passes through the stages of disintegration and reconstruction. Although perennial, yet no part of the bulb is of more than one year's duration. Vegetative reproduction is also very rapid, a new bulb is separated from the parent stock in one season, and may attain full maturity. Bulbs formed from seed, however, require several years before they reach a flowering stage.

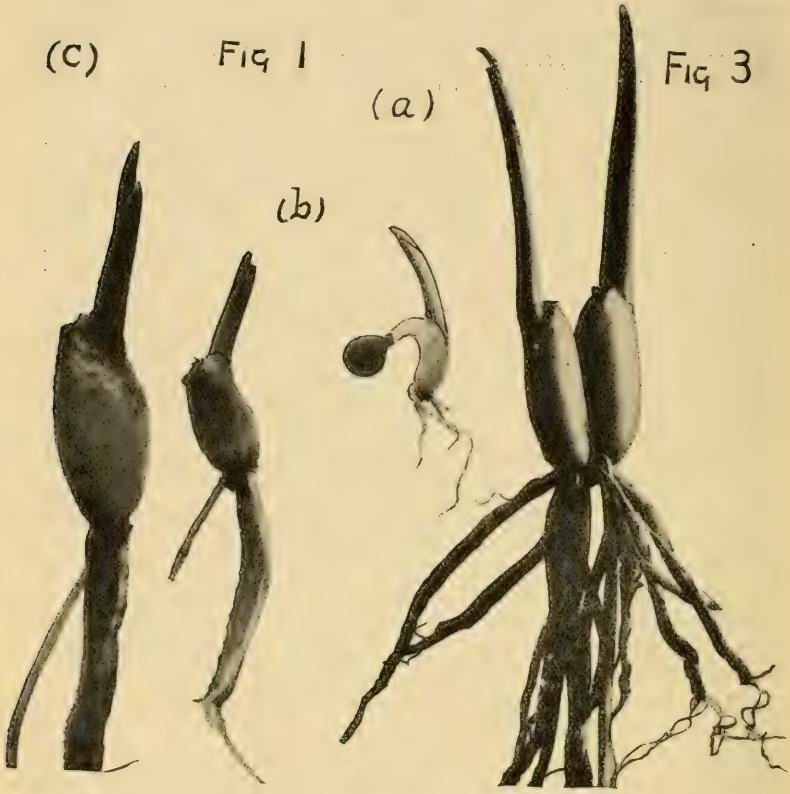
Wherever a garlic bed is situated germinating seeds may be found abundantly on the surface of the soil during February and March. The seedling at once assumes the bulbous structure of the mature plant. The tubular base of the cotyledon is the first part to emerge from the seed coat, it bends downwards, and produces at its base two or more strong contractile roots which tend to pull the plant below the surface.

Judging from the structure of a mature leaf, the cotyledon may be supposed to consist of a lamina, a solid petiole and a tubular base. The lamina remains within the seed coat, and serves to digest the food storage from the endosperm, and to pass it through the petiole to the tubular base, which swells and thus forms the first stage of the bulb. The shoot arises within the tubular base of the cotyledon, and passes out at the point where the tube merges into the solid petiole. Eventually, when the food supply of the endosperm is exhausted, the petiole of the cotyledon withers and falls off, leaving a scar on one side of the small bulb.

The shoot consists of a sheath or tubular leaf base, surrounding one perfect leaf. Only one leaf is produced during the first year; as this develops, the food is withdrawn from the cotyledon ring, which begins to disintegrate, and soon disappears entirely. When the leaf is expanded above ground the food manufactured by the lamina is stored in the tubular base of this leaf, and at the end of the season the lamina and petiole wither and become detached from the leaf base, leaving a scar at one side. The new shoot arises at the base of the tube as before, and emerges at the point where the tube passes into the petiole, thus producing on a larger scale a precisely

similar structure to that of the original seedling bulb, and so year after year.

The photographs in fig 1 show (*a*) a seedling with seed coat attached to the stalk of the cotyledon; (*b*) a bulb of one year's growth; and (*c*) a mature bulb. In (*b*) and (*c*) a scar is seen



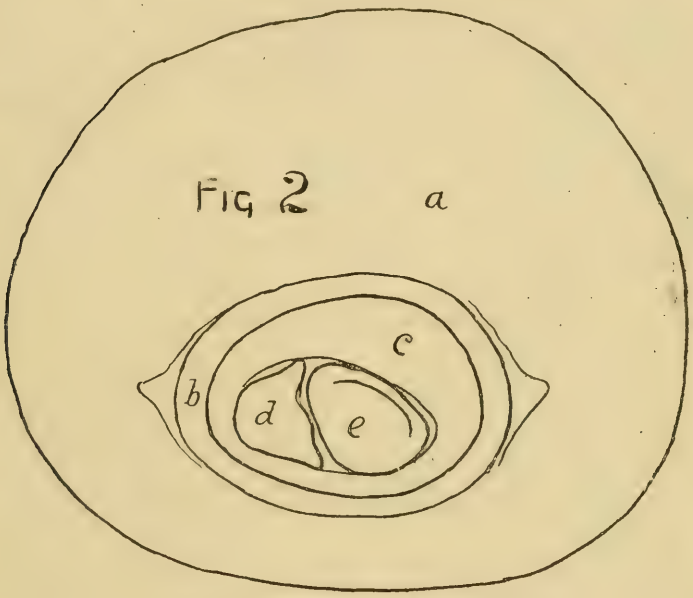
Garlic Bulbs.

on the outer sheath, which shows where last year's petiole was detached.

A mature bulb differs only from the young form in the greater complexity of its shoot, which consists of two leaves and a flower enclosed within a tubular sheath. In bulbs which are about to reproduce vegetatively, two shoots are contained within the same sheath.

Fig 2 represents the section of a mature flowering bulb taken in April; the two leaves and flower stalk were above ground:—(*a*) is the food ring or remnant of last year's leaf;

(*b*) the sheath; (*c*) the tubular base of the first or oldest leaf, which encloses (*d*) the flower stalk and (*e*) the second leaf. In a series of transverse sections taken successively from above downwards this leaf is seen in the stages of lamina, solid petiole, and tubular base. In the figure the crescent-shaped mark shows the interior margin of the tube, which, in its upper regions, is a closed slit, but which opens towards the base. In the deepest sections next year's shoot may be seen arising in the centre of the tube.



Section of Garlic Bulb.

After the leaves are expanded, the old bulb undergoes rapid disintegration. The outer food ring and the sheath will have disappeared entirely at the time of flowering. The tube of the first leaf then ruptures at one side, causing the parts of the bulb to fall asunder, since this leaf and the flower stalk are only attached at the base. Probably the function of the first leaf is to supply food storage for the seeds. It takes no further part in the structure of the bulb, and when the seeds are ripe this leaf and the flower stalk wither off at the base, leaving practically no trace. The second or last leaf (*e*) continues to flourish for some time longer, and its base becomes swollen with food storage. This leaf base is the only part of the season's growth which remains to form next year's bulb.

When the leaf dies the petiole becomes detached from the tubular base, thus leaving the scar which is seen on one side of the bulb in fig. 1.

It may be conjectured that if the first leaf were removed before flowering takes place, no seed would be set, and if from another plant the second leaf were removed, a new bulb would not be formed.

If a number of the older and more deeply rooted garlic bulbs are dug up in February or March, before the shoots have developed, it is not uncommon to find two bulbs apparently of the same degree of maturity joined together by a slight woody attachment at the base, but otherwise quite separate (fig. 3), The attachment indeed is so slight that it will generally have disappeared entirely by the time the leaves are above ground, and there will be nothing to show that these bulbs have been produced vegetatively.

The production of these twin bulb structures is understood when we examine sections of certain mature bulbs, and find that in some cases two shoots are enclosed in a single sheath. The two shoots may be of different ages and degrees of maturity, but since at the end of the season the new bulb is formed only from the last leaf base of each shoot, it follows that when the outer rings have fallen away, the twins may both be of about the same size and age.

The reconstruction of the shoot and the origin of the twin bulb structures can easily be followed in the autumn, after the leaves of the plant have entirely disappeared. At this time the bulbs present a similar appearance to that shown in fig. 1, except that the shoot has not yet emerged from the hollow leaf base; it is indeed, only to be found very low down in the bulb.

Fig 4 shows a series of transverse sections taken from the same bulb. The outer food ring of the bulb is not shown.

I. shows (*b*) the sheath ring, which is seen to resemble the tubular base of an ordinary leaf, and (*c*) the first leaf arising from the axil of the sheath.

II.—The first appearance of the flower is seen in the form of two V-shaped structures, which represent the upper portions of the spathe. The flower arises from the axil of the first leaf (*c*).

III.—The two portions of the spathe become united at their edges. A second leaf (*c'*) appears which, from its position is seen to have arisen like the first leaf from the axil of the sheath. It is this leaf which gives rise to the second shoot axis.

IV.—The flower is seen in section. A third leaf (*e*) is seen arising from the axil of the first leaf (*c*).

V.—The two shoots are now seen separated from each other by their enclosing outer leaf bases. A fourth leaf (*e'*) arises

in the axil of *c'*, and the structure of the shoot is now complete for the ensuing season.

From the description previously given of the disintegration of the bulb, it will be seen that the two last leaves (*e*) and (*e'*), alone are responsible for the formation of the following year's bulbs, and since these two leaves are practically contemporaneous in origin, and of the same stage of development,

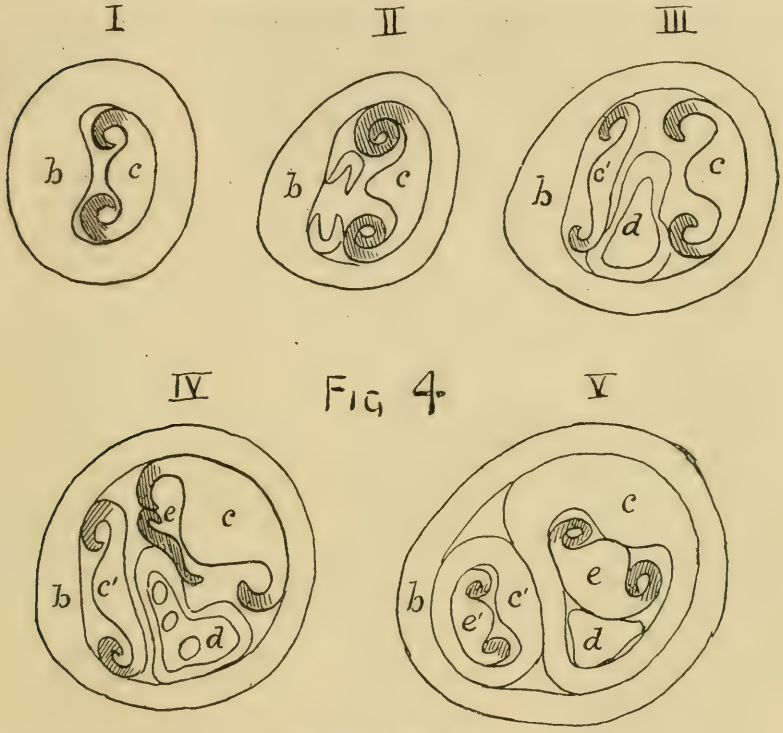


Fig 4.

Sections of a Garlic Bulb.

the twin structure of the vegetatively produced bulbs is explained.

A few points in comparison of the garlic with other bulbous plants may now be noted. The germination of the seed and origin of the bulb is probably typical of a large number of other monocotyledonous plants, and consequently, owing to the commonness of the species and regular production of fertile seed, it will be found to be a convenient plant in which to study this type of germination. The wild hyacinth (*Scilla festalis*) germinates in almost precisely the same manner, and is equally abundant, but other wild bulbous plants, *e.g.*, snowdrop and

daffodil, are very uncertain in the production of fertile seed, and germinating seeds of these plants are seldom found under natural conditions.

The leaf of the garlic presents a perfect type of monocotyledonous leaf in which the three regions lamina, petiole, and tubular base are clearly defined. It is the utilization of the base for food storage which gives rise to bulb structures, but in the garlic the shedding of the outer rings is much more rapid than in other bulbs, and only the last leaf base is retained for winter storage. In the snowdrop and daffodil the leaf bases of two or three years are retained. Also in these latter the flower stalks disintegrate from within, whereas in the garlic they fall away on the outside leaving no trace.

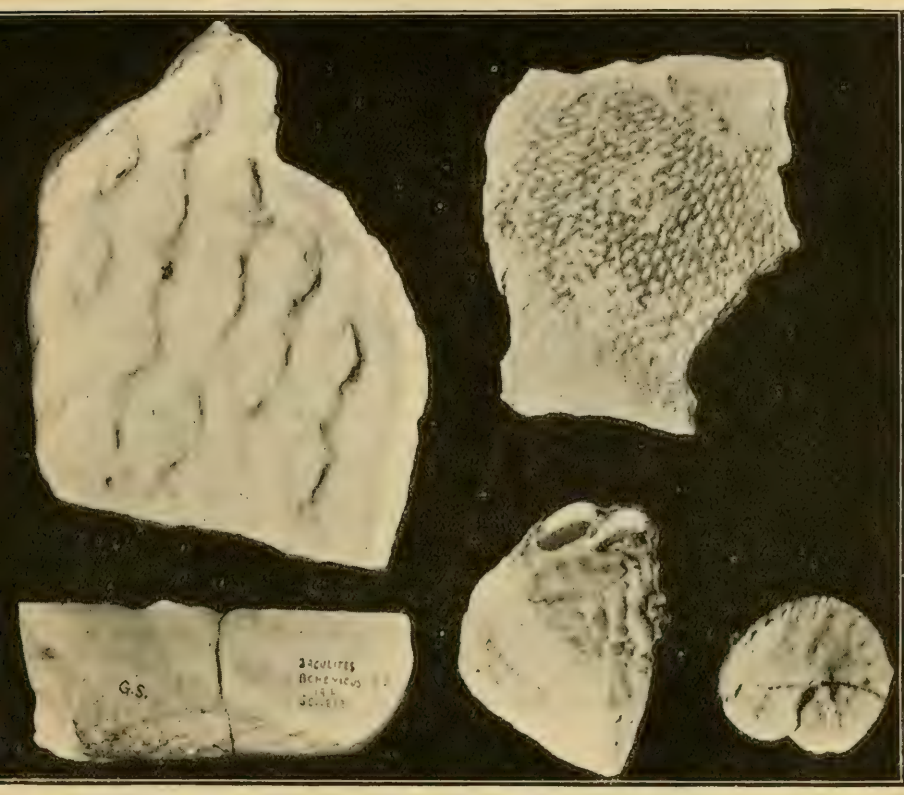
The vegetative reproduction of new bulbs in the garlic is also a distinctive feature. In the snowdrop a new shoot arises from the base of the first or oldest leaf, and at a later period a second shoot may arise from the base of the second leaf. The two shoots are separated from each other by a complete bulbous ring, and each is enclosed in a separate sheath. The second formed shoot is not separated from the old bulb for two or three seasons. In other bulbs consisting of many leaf bases this mode of origin of new shoots in the axils of different leaves appears to be the general rule, but in the garlic where only one leaf base is retained it would be practically impossible and, as has been shown, the second shoot is budded off from the newly developed sheath ring. Consequently, both shoots are enclosed in the same sheath, and the bulbs formed from the two shoots attain maturity and a separate existence in one season.

Some Glimpses of old Hull in the light of recent Excavations. 18 pp. and 6 plates. Hull Museum Publications, No. 89, August, 1912, price one penny. It is only a few months ago that we extended a welcome to a volume on the Evolution of Hull, and now we have a sort of appendix to that work written by the same painstaking investigator. Those whom pursuit of pleasure or business have taken Hull at intervals during the last twenty years must have been struck with the immense improvement that has taken place in the very heart of the city. In order to bring this about, large areas have been purchased and the dilapidated buildings with which they were occupied have been pulled down. The excavations made in the course of preparing for, among other things, the new main street and for the new buildings which now line it on both sides, have brought to light many objects of varying interest. "In an ancient and important city like Hull this is no more than one would have expected, and it is a gratifying feature that there were on the spot keen observers keeping watch for "any relics of the past, and with excellent results." Ample justification for this statement is furnished in the pamphlet before us. Representatives of most of the centuries from the tenth down to the eighteenth, comprising pottery, leatherware, iron-ware, masonry, coins, and pipes, are all described and figured on the plates which accompany the work. Besides these latter there are other illustrations in the letterpress, which serve to make this one of the most interesting of the many publications of the Hull Museum.—E.G.B.

SOME RECENT DISCOVERIES IN THE CHALK OF THE FLAMBORO' DISTRICT.

GEORGE SHEPPARD.

DESPITE the fact that the Upper Chalk of the Flamboro' area possesses a notorious reputation with regard to the paucity



Ventriculites (large form). *Ventriculites* (typical form). *Baculites* sp. *Cephalites bullatus*. *Scaphites*, sp.

of its records, recent investigations have revealed a series of interesting forms, some of which are apparently new to the Yorkshire Chalk.

The chief of these is a portion of a large *Baculites* from the *A. quadratus* zone at Sewerby Cliff. Although, as is the case in nearly all of the Chalk cephalopoda, the shell has not been preserved and consequently no evidences of ornamentation are visible, the typical straight form and elliptical section

are quite sufficient to enable it to be determined generically. The chief interest in this specimen lies in the fact that it compares well with the contemporaneous forms in the German Cretaceous strata. *Cephalites bullatus*—a particularly fine specimen of Hexactinellid sponge was collected recently in the *Marsupites* zone, west of Danes' Dyke. Although the commoner varieties of sponges (*Seliscothon*, etc.) are plentiful at about this horizon, the above species probably has never been recorded before from the Yorkshire Chalk.

Perhaps the most interesting specimen collected among the sponges is a portion of a large *Ventriculites* which must have attained gigantic proportions. Local geologists are fairly familiar with the Ventriculites of the Upper Chalk, but, as a general rule, they seldom exceed a length of 12 inches. As in all this class of sponge the radial canals intersect in a characteristic reticulate manner, the meshes of which measure $\frac{1}{8}$ inch in an average specimen. In the recently found *Ventriculites*, however, the reticulations have an average length of $\frac{3}{4}$ inch. Thus it has been estimated by Mr. Sherborn that this specimen must have been at least 6 feet in total length. As far as he is aware this is the largest Ventriculite which has ever been collected from the English Chalk. Among the cephalopods of the inland quarries of the Flamborough district (Bessingby and White Hill) the most interesting forms are the *Scaphites*. In a typical specimen the shell is coiled in a plane spiral. The whorls are in contact, except the last, which is free from the spiral and then recurved in the form of a hook. The surface of the shell is ornamented with bifurcated ribs and often bears tubercles. Two varieties are common to the Yorkshire Chalk, *Scaphites binodosus* and *S. inflatus*. As a general rule the scaphites have a tendency to occur in definite layers or zones and consequently prove valuable indices to the various horizons.

Other specimens recently added to the Hull Museum collections are :—

Ostrea vesicularis.
Holaster sub-globosus.
Parasmilia centralis.
Cidaris (young).
Micraster (young).
Infulaster rostratus.
Plicatula spinosa.
Pleurotomaria sp.
Camerospongia.
Inoceramus lobatus.
Inoceramus lamarcki.
Micraster cor-anguinum.
Avicula tenui-costata.
Spondylus latus.
Seliscothon planus.

My thanks are especially due to Mr. C. Davies Sherborn, who has kindly named the majority of the specimens.

In the natural history section of the British Museum, a special exhibit has been arranged to illustrate the British Lower Carboniferous rocks and their fossils.

Naturalist.

BIRD NOTES FROM THE YORK DISTRICT.

S. H. SMITH.

THE following is the list of dates of arrival of local migratory species. Many birds were much later than usual, and one species, the cuckoo, noticeably early. There appeared to be a much larger number of cuckoos in the district this year than is usual, and a corresponding scarcity of landrails.

Chiff Chaff, York, March 29th.
Wheatear, York, April 2nd.
Cuckoo, Fangfoss, April 4th.
Cuckoo, York, April 19th.
Cuckoo, E. Cottingwith, April 21st.
House Martin, York, April 22nd.
Swift, York, April 29th.
Turtle Dove, Skipwith, April 29th.
Landrail, York, May 1st.
Whinchat, Skipwith, May 4th.
Sedgewarbler, Skipwith, May 4th.
Redstart, Skipwith, May 4th.
Willow Warbler, York, April 2nd.
Whitethroat (Common), York, April 2nd.
Yellow Wagtail, Stillington, April 13th.
Swallow, Huntington, April 14th.
Swallow, Stillington, April 27th.
Nightjar, Sandburn, April 29th.
Nightjar, Skipwith, April 29th.
Pied Flycatcher, Castle Howard, April 29th.
Spotted Flycatcher, York, May 2nd.
Blackcap, York, May 2nd.
Garden Warbler, York, May 2nd.
Sand Martin, York, May 2nd.

During the night of April 16th and 17th, from 8-30 p.m. to 1 a.m., there was a big rush of small waders, and notes of golden and grey plovers could be distinguished; the night was clear and starry and the birds were passing over Heworth travelling South East. Again on the night of April 19th and 20th and under similar weather conditions many thousands of birds were passing, and from their call notes they seemed to be principally curlew, golden and grey plover. These also were travelling to the South East. On April 20th I saw a large flock of Fieldfares at Heworth and estimated them to be about a hundred, and again on April 21st I saw what may have been the same flock at East Cottingwith. This appears to be a very late date for this species to remain in England.* A male Sclavonian Grebe was obtained at East Cottingwith on February 10th, and is evidently one of a small party, the representatives of which distributed themselves fairly widely during January and February, as reports of observations and captures were made from several quarters. A Great Crested Grebe, male, in winter plumage, was picked up dead at East Cottingwith on February 1st. This bird had been fired at some days previously and had succumbed to a pellet that had lodged in its body. The shoveller duck occurred again at Skipwith, but as far as I can gather only one pair attempted to breed this year, and a fox took the sitting bird and destroyed the eggs just at the time they were almost hatching.

* Flocks of Fieldfares are frequently observed in the county at a later date than this.—ED.

THE DISTRIBUTION OF *HELIX (ACANTHINULA) LAMELLATA* JEFFR.

H. A. SCHLESCH.

It used to be thought that this species was to be found in Great Britain only, but during the past few years it has been recorded from North Germany, Denmark and Sweden. Its usual habitat is in woods near the coast. As a British species it is distinctly a northern form, becoming less common in the Midlands, and rare in the South. It is found in the extreme North of Scotland.

In Ireland it occurs in the maritime counties on the north, south, and west coasts, and in county Louth on the east coast.

In Germany it is found in the northernmost parts on the North Sea Coast and the shores of the Baltic as far as the mouth of the Oder (Pommern) but has not been found in Mecklenburg. It also occurs in Schleswig-Holstein, especially on the eastern side.

In Denmark it is recorded from Jutland, Funen, Zealand, Lolland, Falster, Möen and Bornholm, but is scarce everywhere. Dr. C. A. Westerlund records the species from Sweden, and it probably occurs in Holland.

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Marine Life at Saltburn.—During a week-end somlittle time ago, Mr. C. A. Cheetham and I spent a most intere esting time at Saltburn studying the sea-shore life, more particularly the zoophytes. Of these we found washed up by the tide specimens of the following :—

Thuiaria thuja, Antennularia antennina, Sertularia cupressina, Sertularia argentea, Sertularella rugosa, on washed-up *Flustra foliacea ; Sertularia abietina, Diphasia rosacea ; Calycella syringa,* occurring on *S. argentea.*

Between tide marks we secured the following :—

Sertularia pumila (common), *Sertularia gracilis, Sertularia operculata* (common), *Plumularia setacea* on boulders between Saltburn and Skinningrove ; *Leptoscyphus tenuis,* deep pools on Laminarias ; *Campanularia flexuosa,* deep pools on Laminarias ; *Sertularella polyzonias* on *Halidrys siliquosa, Tubularia simplex,* Staithes ; *Coryne pusilla,* Rock pools, Staithes ; *Clytia johnstonia,* a fine colony on *Corallina officinalis,* rock pools, Staithes.

Between Saltburn and Skinningrove specimens of the common nudibranchs (*Archidoris tuberculata* and *Eolis papillosa*) were found.—A. R. SANDERSON, Bradford.

Naturalist,

THE PYRENOMYCETES AND SOME PROBLEMS THEY SUGGEST.*

Sir H. C. HAWLEY, Bart.

'WHAT are we to understand by the term Pyrenomycetes'? Fries regarded as genuine Pyrenomycetes all fungi with asci developed in closed and ostiolate perithecia, but grouped with them all whose fruit was produced in closed bodies of any description and whether in asci or not. Many of the latter would now be classed as 'Fungi Imperfecti,' as probable stages in the life-history of true Pyrenomycetes.

Most mycologists of the present day are inclined to confine the Pyrenomycetes to the Sphaeriacci in the sense of Berkeley and Cooke, and even thus restricted they form a group as extensive as they are interesting. They have been somewhat neglected in this country. The principal reason for this inattention is the want of an up-to-date English Systematic Text Book. But they offer great attractions to the mycological student. The specimens are at their best in Winter and early Spring when there is a little else to be met with, and, unlike most other fungi, may be put aside and preserved for an indefinite length of time; their fruiting characters affording very diversified and beautiful objects for study they certainly deserve more attention than they get.

The value, or otherwise, of a stroma (a fungoid growth in which the perithecia in some species are imbedded) as one of the characters used in classification is worthy of discussion; also, the immersion of the perithecia in the matrix of the plant substance in which it is growing, contrasted with their superficiality,

Spore characters in relation to colour and septation in many species are of importance. In some cases, however, it is necessary to be certain the perithecia under examination are mature; if not, the results of the examination are misleading. The spores of some species only acquire colour, or become septate late in life. If their position therefore depends on one of these characters, we must be sure that we are dealing with mature specimens. In one specially difficult family, *Lophidium compressum* is an example of a troublesome species whose spores pass gradually through every stage from hyaline and continuous, to coloured and muriform; and probably at some time or other it has been mistaken for most of the species in the Lophiostomaceae; indeed in this family, the slow development of the spores, together with the presence in certain

*Abstract of Paper read at the Yorkshire Naturalists' Union Fungus Foray at Sandsend.

conditions of more or less evanescent hyaline appendages, has led to a woeful multiplication of bad species. The beginner should be very cautious in dealing with it.

A reference to the case of the Discomycete, *Phaeangella Smithiana* Bond. may be excused. First found in Scotland in 1908, and later, near Scarborough,* described at first from immature specimens, it was placed in a genus quite different from the one it now occupies.

Again, in September, 1910, Mr. Gibbs sent me some specimens from near Sandsend that looked like the fairly common *Bertia moriformis*, but though everything else agreed, the spores became as many as 7-septate, whereas *Bertia* should only have 1-septate spores. This may represent a hitherto overlooked character of the species which would necessitate transferring '*moriformis*' to the genus Bertiella. Such few cases are enough to show the danger of the hasty making of species as well as the inconvenience of genera founded on single characters.

There are many other important morphological characters worthy of consideration.

A different question that, so far as the writer knows, has not yet been answered, concerns the Valsaceae—are they typically saprophytes or parasites? The perfect fungus is usually found saprophytic on dead twigs often still attached to the trees. But were the earlier stages—the myceloid and pycnidial—not parasites? It is a difficult question to solve except by cultural experiment, but one would like an answer.

Modern research into the sexual and cytological features of the Pyrenomycetes may possibly affect classification. At present though, as far as an outsider can judge, and as was stated in a paper in this year's 'Transactions of the British Mycological Society,' investigators are not at all agreed as to either the correctness of many of the phenomena recorded, or their significances. There is something attractive in Prof. Lotsy's suggestion † that the true Pyrenomycetes may prove to be separated from allied groups by the presence of vestiges of original fertilisation by trichogyne and spermatia. . . . . *Polystigma rubrum* is one of the few Pyrenomycetes that have been thoroughly investigated so far, and on the ground that it contains very evident gametic organs, trichogyne and spermatia, continuous ascospores and cellular structure little altered from its supposed algal ancestors, it has been made by one writer the type of a new division of Polystigmales.

But it is probably too early to make any radical alterations in classification on these grounds. However, the ordinary

* *The Naturalist*, July 1912, pp. 206-7.

† Vorträge über Botanische Stammesgeschichte, Vol. I., p. 470.

mycologist must await with interest the result of further experiments and will be ready to accept the conclusions drawn from them, if they do not tend to upset obvious affinities and do not ask him to examine the divisions or fusions of nuclei. Any such work must be left to the specialist, as must any attempt to discover by cultures what are the true secondary stages of the Pyrenomycetes. Though here something may be done by field observations.

More collections are wanted. We want to know what are the truly indigenous British species. Many of the species described by Berkely and Broom seem never to turn up again. Perhaps they might if more mycologists would employ their energies in collecting Pyrenomycetes.

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Wild Flowers as they Grow. By G. C. Nuttall, with illustrations from photographs in natural colours by H. E. Corke. Fourth series, 200 pp., 5/- net. London: Messrs. Cassell and Co. This volume is a companion to those bearing a similar title, which we have already noticed in these columns, and, as in the case of its predecessors, its chief charm lies in the series of beautiful plates, well reproduced from colour-photographs taken direct from nature. There are twenty-five such pictures; those of the Blackthorn, Broom, Biting Stonecrop, and Guelder Rose being perfect.

Snowden Slights—Wildfowler, by Sydney H. Smith. 114 pp. T. A. J. Waddington, York. Price 3/6. Mr. Smith has written an extremely interesting account of the life of one of the fine old Yorkshire Sportsmen, the last of what might almost be termed the typical East Riding Wildfowlers. Members of the Vertebrate Section of the Yorkshire Naturalists' Union will have a pleasing recollection of the visit of this fine old man, over eighty years of age, to one of their winter meetings, when he entertained them with some interesting reminiscences. Snowdon Slights followed the occupation of basket maker in summer and wildfowler in winter. Mr. Smith gives full particulars of both vocations, and of his struggles, failures and successes, and incidentally we are introduced to some interesting phases of life in the old world village in which he resides. Instructive chapters are those devoted to "Punts and Punt shooting," "Guns, Dress and Dogs," and much useful information is imparted concerning these necessary adjuncts of a wildfowler's outfit. Chapters on Salmon, Eel and Lamprey trapping illustrate another side of Slight's occupations. The author, in one respect, is scarcely happy here, for although Slights manufactured eel traps of oiser, he is shown in the illustrations using those made of netting. Chapter VI is devoted to a list of the birds of the Derwent Valley. This appears to be a careful and accurate account of the birds to be found there, together with a list of rareties which have been obtained from time to time. Popular names, always the most interesting in these local lists, are however not dealt with sufficently, as an instance the first bird mentioned, the Missle Thrush, has no local appellation given to it. The analyses of the shots with the big gun are valuable as showing the comparative scarcity or abundance of fowl in different seasons. The book is well illustrated with photographs by the author, though as the blocks have apparently previously been printed elsewhere, they are of varying sizes and merit. It may be commended to all Yorkshire Naturalists and sportsmen, not only as a biography of an interesting type of the sturdy Yorkshireman of the old school, but also as a valuable record of the wild life in a district which is even now losing some of its peculiar characteristics, and which no doubt in time, owing to the advance of civilisaton, will cease to be a great winter haunt of wildfowl. R.F.

FIELD NOTES.

MAMMALS.

Whiskered Bat in Craven.—A specimen of this bat was obtained in Skipton Woods, near the old Corn Mill, in August of last year. It was sent to me by the Secretary of the Craven Naturalists' Society.—WALTER WILSON, Colne.

The two White Hares (?) of Sheffield —For some months I tried without success to get accurate information on the above subject for Major G. E. H. Barrett-Hamilton for his work on 'British Mammals.' In J. C. Walter's 'Stray Leaves of Travel,' 1910, p. 180 (and in other publications), there is a statement that at Sheffield a rent is paid for some property enjoined by ancient deed, which consists of two white hares to be paid on St. John's Day (Dec. 27th). Eventually I received the desired information from Mr. S. O. Addy, of Westbourne Road, Sheffield, and that gentleman has kindly given me permission to publish it in *The Naturalist*, viz:—'The alleged chief rent of two white hares in Sheffield in 39 Edw. III, was due to a mistake of the Rev. Edward Goodwin, who mis-read "*duos leporarios albos*" (two white greyhounds) as "*duos lepores albos*" (two white hares). See Pegge's Anonymiana, 1818, p. 159. There is no such rent in Sheffield.'—H. B. BOOTH, Ben Rhydding.

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BIRDS.

Osprey at Scampston —An Osprey has been at Scampston for about ten days this month. It was first seen by us on the 10th, but some of our men working near the lake noticed it several days earlier. As is unfortunately usually the case, this Osprey was by no means shy, and could be closely inspected with glasses, and otherwise, as he sat preening his plumage, or pulling up his prey, on one of his favourite perches, a Scotch Fir, a very large Black Poplar, and a stag-headed Oak. The latter is only about 150 yards from the terrace on which he allowed us to stand watching him, without showing any alarm. Roach were his principal prey, and their scales and fragments were plentiful under his perches. I watched the bird from my dressing-room fishing early in the morning of the 17th, and about 8-30 a.m. he was noticed passing near the house flying north, quite low down. This was the last that we saw of him.—W. H. ST. QUINTIN, October 23rd, 1912.

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'The Transactions of the North of England Institute of Mining and Mechanical Engineers,' Vol. LXII., part 6, contains a well illustrated paper on the use of X rays in the examination of coal, by Messrs. F. C. Garrett and R. C. Burton.

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GERALD E. A. BARRETT-HAMILTON. Lancs., N., Derbyshire, Yorks.
A History of British Mammals, Part IV. [refers, p. 190, to fossils remains of the long-eared bat being found in Hoe Grange Cavern, Derbyshire; (in part VI) to fossil remains of mole in Teesdale Caves, Yorks; and (in part VII) to fossil remains of hedgehog at Warton Crag; (part VIII.), pp. 86-87, to remains of the Common Shrew being found at Warton Crag, Lancs.; (part IX), remains of Water Shrew in Dog Holes Cave, Lancs., p. 132].

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Two Neolithic Axe-Heads from Holderness [one made of Borrowdale Ash]. 'The Naturalist,' Jan. 1911, p. 18.

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The Relationship of the Permian to the Trias in Nottinghamshire [refers to Yorkshire, Durham, Lancs., etc.]. 'Quart. Journ. Geol. Soc.', Vol. LXVII., pt. 1, Feb. 1911, pp. 75. Abstracts in 'Nature,' Jan. 12th, 1911, pp. 360-361 and 'Geol. Mag.', Feb. 1911, pp. 91-92.

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Yorkshire Glacial Committee [in the Yorkshire Naturalists' Union Report for 1910. Includes records by T. Sheppard and J. W. Stather]. 'The Naturalist,' Jan. 1911, pp. 65-66.

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The Bunter Sandstone of Nottinghamshire and its Influences upon the Geography of the County. 'Ann. Rep. and Trans. Nott. Nat. Soc.', 1909-10 (publ. 1911), pp. 17-28.

A. G. TANSLEY [edited by]. Northern Counties.
Types of British Vegetation [refers to peat beds, etc.]. Cambridge, 1911, 416 pp.

JOHN W. TAYLOR. Yorks., Northumberland, Cheshire, etc.
Monograph of the Land and Freshwater Mollusca of the British Isles. Part 18 [includes map showing the 'geological distribution of *Helix aspersa* in Northumberland and Cheviotland, Lanc. Mid; Cheshire, and Lincs. N.; *H. nemoralis* in Lancs., Mid., Yorks., Mid W., S.W., and S.E., and Notts.; and *H. hortensis* in Cheviotland, Northumberland, Lancs., M.; Yorks., Mid. W., and Lincs., N.]. Pp. 305-368, and 5 plates, June 1911.

RAMSAY H. TRAQUAIR. Northern Counties.
The Ganoid Fishes of the British Carboniferous Formations, Part I., No. 5. Palæoniscidæ [describes *Cycloptychius carbonarius* from Northumberland and Yorkshire; *Rhadinichthys monensis* from Yorkshire; *R. wardi* from South Lancashire; *R. macrodon* from Yorkshire; *R. hancocki* from Northumberland and Yorkshire; *R. planti* from Lancashire and Yorkshire]. 'Report Palæont. Soc. for 1910' (publ. 1911), pp. 123-158, plates XXXI.-XXXV.

(*To be continued*).

Naturalist,

BRITISH ASSOCIATION NOTES.

Dr. B. N. Peach's address to the Geological Section dealt with the Cambrian Faunas of Scotland and North America, and with the Cambrian Palæogeography of the two areas.

In a paper on 'Prehistoric Remains in the Upper Stort Valley,' Dr. A. Irving (the discoverer of the famous 'Prehistoric horse' which turned out to be a modern one), recorded bones of horse, ox and sheep!

The Erratic Blocks Committee's report contained many Northumberland and Durham records, by Messrs. Weyman, Walker, Woolacott and Smythe; Dogger Bank records by Mr. J. W. Stather, and records from a bank in the Humber estuary, by Mr. T. Sheppard.

A sum of £1036 18s. 8d. was voted by the British Association at Dundee for scientific purposes. Among the amounts we notice the following:— Erratic Blocks, £5; Old Red Sandstone of Dura Den, £75; Nomenclator Animalium genera et subgenera, £100; Roman sites in Britain, £15; Structure of Fossil Plants, £15; Jurassic Flora of Yorkshire, £15; Corresponding Societies, £25.

At the Conference of Delegates, Miss A. L. Smith gave the results of the circular sent by the British Mycological Society to the various corresponding societies of the British Association in reference to certain Fungoid pests. There had practically been no response. Mr. Harold Wager referred to the work of the Yorkshire Mycological Committee, and submitted a list of the published papers and records issued by the members of the Committee. This had been compiled by Mr. C. Crossland, and contained several hundred entries.

At one of the evening discourses, Dr. Arthur Keith dealt with 'Modern Problems relating to the Antiquity of Man.' He concluded that 'the problem of man's antiquity is not yet solved. The picture I wish to leave in your minds is that in the distant past there was not one kind but a number of very different kinds of men in existence, all of which have become extinct except that branch which has given origin to modern man. On the imperfect knowledge at present at our disposal, it seems highly probable that man, as we know him now, took on his human characters near the beginning of the Pliocene period. How long ago that is must be measured, as Professor Boyd Dawkins insists, by the changes which the earth and living things have undergone, and yet it is only human to try to find a means of measuring that period in a term of years, and the estimates at hand give an antiquity of at least a million and a half of years.'

Prof. G. Elliot Smith, in his address to the Anthropological Section, said: 'In these discursive remarks I have attempted to deal with old problems in the light of newly-acquired evidence; to emphasise the undoubted fact that the evolution of the Primates and the emergence of the distinctively human types of intelligence are to be explained primarily by a steady growth and specialisation of certain parts of the brain; that such a development could have occurred only in Mammalia, because they are the only plastic class of animals with a true organ of intelligence; that an arboreal mode of life started Man's ancestors on the way to pre-eminence, for it gave them the agility, and the specialisation of the higher parts of the brain incidental to such a life gave them the seeing eye, and in course of time also the understanding ear; and that all the rest followed in the train of this high development of vision working on a brain which controlled ever-increasingly agile limbs.'

The *Index Generum et Specierum Animalium* Committee gave its final report. 'As regards the continuation of the work, the Committee has great pleasure in reporting that the Trustees of the British Museum have included the compilation of the "Index Animalium" in the General

Library Service of the British Museum (Natural History). It has thus become an official undertaking, and Mr. Sherborn will rank as "Special Assistant" on the staff. This is most gratifying to all parties concerned, for it ensures the safety and completion of the manuscripts which have accumulated during the past twenty-two years. There are now some 664,000 slips, representing 332,000 entries in duplicate, and a great mass of manuscript notes on the dates of books which have passed or will pass through the compiler's hands. Much of this has been printed separately, or been included in the official catalogue of the libraries of the British Museum (Natural History). All manuscripts and documents connected with the work have been handed over by the Committee to the Trustees of the British Museum for preservation in the Natural History Museum, where they may be seen, on application during official hours, by those interested.'

Prof. Archibald Barr's presidential address to the Engineering Section was particularly refreshing, and appealed to engineers to have a little regard for beauty in their work. For example, construction in steel is a very modern art, and it has been in the hands of engineers who usually neglect, if they do not despise, the study of the fine arts. But why have architects, with their artistic training, not succeeded in producing structures in steel as admirably as those they design in stone? Partly, no doubt, because they are hampered by tradition. They have not yet fully realised the difference in spirit that must characterise fit designs in the newer and the older materials. No one can be an artist in any material, the possibilities and limitations of which he has not fully mastered. Again—if a common engineer may venture the criticism—the architect, as a rule, has not sufficiently mastered the science of construction, and has been too much addicted to taking the easy course of adopting a decorated treatment instead of striving to secure elegance of structural scheme as such; and decoration, at least on anything like traditional lines, is wholly incompatible with the best possibilities of steel as a structural material. Progress is being made in the art of designing efficient and graceful structures in metal, but the best results can only be attained by a designer who has a thorough scientific and technical knowledge of the properties of steel and the processes of its manipulation, on the one hand, and cultured artistic sense and capacity on the other. These should not be considered as appropriate equipments for separate professions.

At the Section of Education, under the title of 'The Museum, the School, and Nature-Study Teaching,' Mr. A. R. Horwood was bold enough to state that 'museum officials have *at last* realised the necessity of studying the needs of the visitors to the collections under their charge. The search for knowledge through the impetus given by free education has made museums, along with similar institutions, centres for research . . . Moreover, it is obvious that the museum is merely part of a general scheme of education that each child in its educational progress may (or should) make use of, in the same way as an art or technical school, free library, and so on. Hitherto, however, this fact has been lost sight of. A parallel feature of modern education has been the rise of Nature-study. Evolved from the old object-lessons, it has now emerged as an experimental subject into the clear light of advanced methods. *This being so, it is a subject to encourage.* Within the last ten years museums have been much visited by schools. But it is unfortunate that the true inter-connection between the two has been ignored, and the museum has not been used to advantage. There has been no co-operation. Teachers have used museums in *their* way without inquiry. Recently, however, realising the necessity of ensuring the effective use of Leicester Museum, lectures have been delivered to the elementary school teachers upon the material in the museum and upon the general principles of scientific subjects with considerable success. This system is advocated elsewhere.' It is satisfactory to learn that the

Leicester Museum is at last falling into line with other museums. but it is amusing to find it posing as a pioneer. Not only have other museums for years been doing what Leicester now advocates, but in some districts, as in Yorkshire, societies have been formed among the teachers for the special object of encouraging Nature-study, and working in conjunction with the museums.

Dr. P. Chalmers Mitchell's address to the Zoological Section was an appeal for the preservation of the world's fauna. He pointed out that Audubon relates that just a century ago Passenger Pigeons existed in countless millions, and that for four days at a time the sky was black with the stream of migration. 'The final extinction of this species has taken place since the last meeting of the Association in Dundee. In 1906 there were actually five single birds living, all of which had been bred in captivity, and I understand that these last survivors of a prolific species are now dead, although the birds ranged in countless numbers over a great continent.' It was also shown that South Africa, less than fifty years ago, was a dream that surpassed the imagination of the most ardent hunter. 'And we know what it is now. It is traversed by railways, it has been rolled over by the devastations of war. The game that once covered the land in unnumbered millions is now either extinct, like the quagga and the black wildebeeste, or its scanty remnant lingers in a few reserves and on a few farms. The sportsmen and the hunter have been driven to other parts of the Continent, and I have no confidence in the future of the African fauna.' He concluded that 'However we improve the older menageries and however numerous and well-arranged the new menageries may be, they must always fall short of the conditions of nature, and here I find another reason for the making of zoological sanctuaries throughout the world. If these be devised for the preservation of animals, not merely for the re-operation of game, if they be kept sacred from gun or rifle, they will become the real zoological gardens of the future, in which our children and our children's children will have the opportunity of studying wild animals under natural conditions. I myself have so great a belief in the capacity of wild animals for learning to have confidence in man, or rather for losing the fear of him that they have been forced to acquire, that I think that man, innocent of the intent to kill, will be able to penetrate fearlessly into the sanctuaries, with camera and notebook and field-glass. In any event all that the guardians of the future will have to do will be to reverse the conditions of our existing menageries, and to provide secure enclosures for the visitors instead of for the animals.'

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Bees shewn to the Children, by Ellison Hawks, T. C. and E. C. Jack, 120 pp., 2/6 net. This well written little volume is the latest addition to Messrs. Jack's admirable "Shown to the Children Series", and is by the Secretary of the Leeds Astronomical Society. In simple language it describes the wonders of the Bee world. The volume is made even more fascinating by 39 plates, as well as illustrations in the text.

The Humble-Bee, by F. W. L. Sladen, 283 pp., Macmillan and Co., 1912, 10s. net. The sub-title of this work perhaps better describes its aim, as it deals with the Humble-Bee, "its life history and how to domesticate it," with descriptions of all the British species of *Bombus* and *Psithyrus*. These descriptions, with the excellent coloured plates, are a valuable feature of the volume. Some of the matter had previously appeared elsewhere, but among that now published for the first time is a description of what Mr. Sladen calls the "Sladen wooden cover for artificial nests," and details of his humble-bee house. The book is by no means technical and adds much to our knowledge of the humble-bee. There are many interesting illustrations from photographs. The work is also well up-to-date as it contains a chapter on notes made during June and July of the present year.

NEWS FROM THE MAGAZINES.

British Birds for October has a well-illustrated paper on the Bearded Tit, by Miss E. L. Turner.

Knowledge for October contains a magnificent portrait of the late Sir Joseph Dalton Hooker, at the age of ninety-four.

Mr. J. W. Jackson describes some Mollusca from the Lancashire Coal Measures, in the *Geological Magazine* for October.

In *British Birds* for September there is a record of the Continental Hedge Sparrow having been shot at Spurn in October 1911.

The Entomologist for October contains a portrait of Prof. Edward Bagnall Poulton, who was President of the Second International Congress of Entomology at Oxford, 1912.

A portrait and obituary notice of the late Ludwig Ganglbauer, the well-known writer on Palearctic Coleoptera, appears in *The Entomologist's Monthly Magazine* for September.

In the *Journal of the Board of Agriculture* for September, Mr. F. V. Theobald writes on 'The Aphides on Mangolds and Allied Plants,' and Mr. W. E. Collinge has an article on 'The Food of Nestling Birds.'

The *Zoologist* (No. 854) contains a paper on the Habits and Colouration of the Starling, by Mr. F. J. Stubbs, in which he refers to the fact that in East Lancashire he has never observed the starlings at rest on any animal, whereas this habit is common to the birds in other districts. Mr. J. M. Charlton continues his Northumberland bird notes.

In the *Entomologist's Monthly Magazine* Mr. G. T. Porritt describes an all-black form of the Magpie Moth under the name of *Abraxas grossulariata* var. *nigra*. The following is the description given :—'All the wings both above and underneath of a very dark blue-black, with the usual black markings of the species showing through of a still more intense black, except that on the hind-wings there are no spots except the marginal series, and these smaller than usual. Head, thorax, and abdomen of the more intense shade of black. The only trace of bright colour consists of a very few dark orange scales just at the junction of the hind wings with the thorax ♂.'

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Spiderland. By **R. A. Ellis.** Messrs. Cassell & Co. Price 3/6 net. The value of this book lies in the fact that it fills a distinct want, namely, a popular book on spider life, suitable for young people. It is written in an interesting style, and should at least serve to remove many of the common prejudices against spiders. It is rather a pity for English readers that the author did not confine himself to English species, instead of recurring here and there to North American forms. There are many English species whose forms, habits and life histories are quite as interesting as the American; and the value of the book for outdoor observation would have thereby been increased. The illustrations, some coloured, many from the author's own photographs, are all that can be desired.

House-Flies, and how they Spread Disease. By **C. G. Hewett.** Cambridge University Prees. 1/- net.

In view of the general interest now being taken in the spread of infectious diseases by house-flies and the 'kill that fly' crusade which is being taken up by the popular press, it is satisfactory to find from the Cambridge University Press, a popular and sober account of the unquestionable harm done by these small insects. In the present work it is clearly shown that the animals feed and breed in the vilest of situations, and it is easily demonstrated that this filth is carried to food used in consumption, and even to the human subjects direct. Dr. Hewitt's book, which is well illustrated, contains an admirable summary of this important subject.

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T. SHEPPARD, F.G.S., F.R.G.S., F.S.A.Scot.,
THE MUSEUMS, HULL;
AND
T. W. WOODHEAD, Ph.D., F.L.S.,
TECHNICAL COLLEGE, HUDDERSFIELD.

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NOTES AND COMMENTS.

SIR JOSEPH HOOKER ON FOSSIL PLANTS.

Dr. Dukinfield H. Scott takes the work of the late Sir Joseph Hooker on Fossil Plants as the theme for his presidential address to the Linnean Society, recently published. In view of the loss to botanical science by the death of Sir Joseph Hooker the subject was peculiarly appropriate. Sir Joseph's first botanical paper, written so long ago as 1842, dealt with fossil wood from the Macquarie Plains in Tasmania. This fossil tree was found embedded in Tertiary basalt, and is now in the British Museum. No sections were cut at the time, and it was not until 1903, more than sixty years later, that Dr. Arber described the plant as *Cupressinoxylon hookeri*. Dr. Scott's address is an admirable summary of Sir Joseph Hooker's contributions to palæo-botany.

EXTINCTION OF WHALES.

In his report on the Belmullet Whaling Station made to the British Association at the Dundee meeting, Mr. S. T. Burfield gives the following interesting note in reference to the extinction of the larger Cetacea.—In view of the large numbers of the largest kinds of Cetacea which are now killed every year, the question of their probable extinction in the course of comparatively few years must be seriously considered. The case of Steller's Sea-cow (*Rhytina*) is a well-known example of extinction produced by excessive hunting in recent times. With a view to preventing this possible fate there is some discussion as to legislation in Norway and England. It is suggested that there should be a closed season for the Northern Whale ' Fisheries ' as in the Seal ' Fisheries.' The serious point is that so many gravid females are killed, and it is impossible for the whalers to identify a gravid female as such while she is swimming in the water. Naturally, the proposed limitation of the whale-hunting does not meet with the approval of the whalers. According to them the whaling in the Northern stations will cease automatically *before* the extinction takes place. As mentioned above, a minimum catch of about thirty whales per steamer in the Northern stations is necessary for a factory to keep working at a profit. Thus, when this minimum has been passed, the whaling station closes down automatically. It is said that this will take place before the total extinction of the species on account of the minimum catch being comparatively high.

THE MANCHESTER MUSEUM.

On October 30th a substantial extension to the Museum at the University of Manchester was opened by Mr. Jesse Haworth, who had subscribed over £8,000 towards the cost. The new building, which was inspected by a particularly large

company, is in keeping with the rest of the University, and enables the magnificent Egyptian collections in the Museum to be properly displayed. There can be no question that the value of the Manchester Museum is now increased to an enormous extent, through the generosity of Mr. Haworth and other helpers who have, in all, subscribed over £12,000. Professor Flinders Petrie gave an address, and speeches were made by many influential people. A well-illustrated handbook, with excellent illustrations of the more important Egyptian exhibits, was presented to each of the visitors.

A BRITISH ECOLOGICAL SOCIETY.

The multiplication of special scientific societies is as alarming as it is essential. The latest proposition is that a British Ecological Society should be formed, and in view of the enormous amount of work that has been done in recent years by the Central Committee for the Survey and Study of British Vegetation (British Vegetation Committee) and others, there is perhaps little wonder that such a proposal should be made. Northern botanists, and specially Yorkshiremen, have taken a prominent part in connection with this 'Botanical Survey' work. Any of our readers interested in the matter are requested to send a card for particulars to Dr. W. G. Smith, 9 Braidburn Crescent, Edinburgh. The proposed subscription is a guinea; the officers suggested are, a President, Honorary Treasurer, and a paid Secretary, and it is also hoped to publish a quarterly journal.

BRITISH MARINE CERCARIAE.

In *Parasitology*, Vol, iv., No. iv., Miss Marie V. Lebour, of the Leeds University, gives an admirable review of the British Marine Cercariae. As Miss Lebour points out, the study of the life histories of digenetic Trematodes is as yet in its infancy, and in many cases it is even yet impossible to say anything of the larval forms of many described species. Having paid particular attention to the Trematodes, Miss Lebour, in the present memoir, has summarised all that is known of the species inhabitating birds and fishes, and these she has brought together in order that it may form a nucleus around which future work may be centred. Miss Lebour also deals with the difficult question of the classification on the Cercariae; there is an extensive bibliography, and numerous excellent plates. We should like to congratulate Miss Lebour upon the excellent work she has accomplished in an exceedingly difficult and, to most of us, uninviting, branch of natural science.

AN INTERESTING YORKSHIRE CALAMITE.

In the *Memoirs and Proceedings of the Manchester Literary and Philosophical Society*, Vol. LVI., No. 17, our contributor,

Miss Mary A. Johnstone, B.Sc., has an interesting paper on '*Calamites* (*Calamitina*) *varians*, Sternb., var. *insignis*, Weiss.' The specimen which she illustrates and describes was obtained from the quarry of the Bradford Brick and Tile Company, and formed the core of one of the clay nodules which are abundant in the shale bands below the Better Bed Coal. The specimen contains many interesting physiological features, which are described in minute detail. Incidentally Miss Johnstone disagrees with the conclusions formed by Mr. A. R. Horwood, of the Leicester Museum, who recently described some Calamites in the Journal of the Linnean Society.

THE SCUNTHORPE MUSEUM.

The Scunthorpe Museum Committee has issued a penny

Liassic Fossils from Scunthorpe.

1. ***Cardinia*** sp.; 2. ***Cardinia hybrida***; 3. ***Gryphœa incurva***; 4. ***Lima*** sp. (end view); 5. ***Pholadomya ambigua***; 6. ***Pleurotomaria anglica*** (?).

illustrated guide to its collections, which are housed in rooms in the Public Library, near the Railway Station. The honorary Curator, Mr. A. C. Dalton, and a number of willing helpers, have gathered together a representative series of objects illustrating the geology, archæology and natural history of the Scunthorpe district. The Guide is written by Mr. T. Sheppard, and is well illustrated.

SNAKESTONES.

Some little time ago we figured some Ammonites or 'Snakestones,' upon which 'heads' had been carved by the Whitby dealers. The illustrations came under the notice of Mr. Walter W. Skeat, and in *Folk-Lore* (Vol. 23, No. 1) he gives an admirable paper on 'Snakestones and Stone Thunderbolts as subjects for Systematic Investigation.' The paper occupies

nearly forty pages, and particularly appeals to northern naturalists. It contains much information in reference to St. Cuthbert's beads (*Encrinites*), St. Peter's fingers and thunderbolts (*Belemnites*), Devil's toe-nails (*Gryphæas*, not 'graphites') and snakestones. He also refers to horses' or asses' feet (*Hippopodium*), seraphims (*Pterygotus*), giant's teeth and bones (mammoth), bones of Angels (saurian remains); celestial cannon balls (iron pyrites), etc.

A PHEASANT'S MEAL

In *The Scottish Naturalist* for November, Mr. P. H. Grimshaw gives the following list of contents of a single crop of a pheasant shot in Argyllshire:—Diptera, *Bibio lepidus*, 2286 specimens, *Pollenia rudis*, 1; the Heather Beetle (*Lochmaea suturalis*) 508; Ant (*Myrmica rubra*) 2; Grasshopper (*Stenobothrus*, sp.) 1; Mollusca (*Planorbis*, sp.) 2, a total of 2,800 specimens, and these figures without counting the legs, heads, and other fragments. In addition were 'Numerous tubers of Lesser Celendine, one seed-capsule of Mouse-Ear Chickweed, fragments of mosses and grasses, small stem with leaves of Heath Bed-straw, tiny shoot of heather, many fragments of leaves of the Bulbous Crowfoot, and a few leaflets of the Cuckoo-flower. It seems a pity that the poor bird was shot or it might have made a really respectable meal. Mr. Grimshaw concludes on the evidence of the above figures, 'I think we may fairly claim that the Pheasant is likely to be of use in the checking of the ravages caused by the heather beetle, and may be classed with the Blackcock as a beneficial visitor to our grouse moors.'

——: o :——

A Museum is suggested for Burton-on-Trent.

The Rev. E. A. Woodruffe Peacock has been elected a Fellow of the Entomological Society.

The natural history collections of the late W. F. Webb, have been presented to the Mansfield Museum, by Miss Webb.

There is only one item under 'Mollusca,' in Quaritch's recent Catalogue of Zoological etc., works, and it is Huxley's 'The Crayfish'!

Through the kindness of Mr. J. P. Thomasson, the Bolton Museum now possesses the collections of mollusca and lepidoptera formed by the late J. W. Baldwin.

In a recent issue of a 'popular' scientific magazine, the following remarkable 'description' is given of the Greenland Falcon:—'White and black; larger than a crow.'

A prize has been awarded to D. H. Peacock, of Trinity College, for his investigations on Hydroxyhydrindenehydrazine and 1 : 2 : 4—Triketopentamethylene. He seems to have earned it.

Sir Charles Hercules Read, LL.D., the President of the Society of Antiquaries, and the president-elect of the South-Eastern Union of Scientific Societies, recently welcomed the members of the Union to the Rooms of the Society of Antiquaries, Burlington House. Tickets were 1/6 each, 'to include the cost of tea, printing, stationery and postage, etc.' We wonder what the 'etc' covered.

Naturalist,

FIELD NOTES.

BIRDS.

Fork-Tailed Petrel near Harrogate.—On November 4th a specimen of Leach's Fork-tailed Petrel was picked up at Killinghall, near Harrogate, by Mr. T. W. Strother. During the night and early morning the weather was foggy and the bird had no doubt become confused and lost its way, meeting its death by flying against the telegraph wires; there was no wind. From the size it is probably a female. R. FORTUNE.

—: o :—

MOLLUSCA.

***Adeorbis subcarinatus* at Scarborough.**—In examining some shell-sand which I got at Scarborough, I found a specimen of *Adeorbis subcarinatus*. This shell does not appear to have been previously recorded for Yorkshire. The nearest locality given by Jeffreys is Aberdeenshire. Its common locality is the South Coast, and the Channel Islands, though it has been found at Lamlash, Bute, and Barmouth.—F. H. WOODS.

Dispersal of Fresh-water Shells.—In March last, Mr. Harold Walsh, of Luddenden, brought to me a number of living specimens of a young fresh-water cockle, which were attached to the legs of a species of fresh-water bug found in a small reservoir situate at an elevation of nearly 1,000 feet on the Middle Millstone grits of the Carboniferous rocks at Crag Vale. The reservoir is fed by a stream arising in the high moorlands to the west of our Halifax Parish.

The associated insect belongs to the genus *Corixa*, the shells are all young examples of *Pisidium pusillum* (Gmelin). The *Corixa* were very lively and were nearly all furnished with a shell holding by the grip of its valves to the hind leg, and usually to the trasi of the insect; in several instances there were two shells, being one to each hind leg. Apparently we have here a provision for the dispersion of the shell by insect agency. Mr. Wallis Kew, in his excellent book on 'The Dispersal of Land and Fresh-Water Shellls,' cites several records of similar phenomena.

If any one will collect *Pisidia* during the coming *early spring*, I feel sure that he will find these curious methods of dispersion commoner than has been hitherto thought.

My best thanks are due to B. B. Woodward, Esq., of the British Museum, for confirming the names of the specimens.

W. CASH.

The New Phytologist for October contains a paper on the 'Influence of the Structure of the Adult Plant upon the Seedling,' by H. F. Wernham, and a Description of two Fossil Prothalli from the Lower Coal Measures' (of Dulesgate), by R. C. McLean.

THE MILLSTONE GRIT OF YORKSHIRE:

Some New Evidence as to its Source of Origin.*

ALBERT GILLIGAN, B.Sc., F.G.S.

More than fifty years ago Dr. H. C. Sorby attempted to trace the source whence the material which makes up the Millstone Grit had been derived, by making a collection of pebbles which occur so abundantly in some of the beds. Among these he found some small fragments of mica-schist, quartz-schist, and a few pebbles of undoubted granite. The largest pebble he obtained was about four inches in circumference and of a type resembling a fine-grained syenite or greenstone, but too much decomposed to be accurately identified. The pieces of granite were composed of quartz and felspar, suggesting by their appearance derivation from coarse-grained granites. Pebbles of quartz he found to be commonest, and he also described some pieces of white or brownish orthoclase felspar.

The granites he found were quite unlike any with which he was acquainted in the British Isles, being too coarse and much more like those of Scandinavia. Further, the current bedding, which Dr. Sorby examined over an area of twenty-five square miles, pointed to a drifting from the north-east, and he therefore suggested some south-westward prolongation of an ancient Scandinavia as the source of origin of the material making up the great mass of the Millstone Grit of Yorkshire. Since this early work by Dr. Sorby nothing has been added to our knowledge of the lithology of this, to most people, uninteresting series of rocks. The late A. Longbottom, B.A., of the Nigerian Survey, collected some very large pebbles from the Middle Grits of Silsden. These have been examined by the author, who has also extended his researches into the other beds of the series in various parts of Yorkshire. Some of the pebbles are of a very large size, one obtained from Netherwood Plantation Quarry, Silsden, measures 10 inches by 8 inches by 3 inches, and is a reddish granitoid rock with large porphyritic felspars. The pebbles show a remarkable assemblage of rocks, igneous, sedimentary, and metamorphic all being represented, but by far the commonest are acid igneous rocks—granites, quartz and felspar porphyries. Only one specimen of basic igneous rock has been found. The metamorphic rocks are quartz-schist and mica-schist with a few fragments of gneiss. One of the mica-schist pebbles has been identified by Mr. Barrow as similar to a rock described by him occurring in the Moine Schists of the East Central Highlands. Numerous pebbles of felspar have been examined by the author and in

* Read at the Meeting of the British Association at Dundee.

each case found to be perfectly fresh microcline, the cross-hatching being beautifully clear. Pieces of pegmatite, the constituents being quartz and microcline, are very common in all the beds, but most abundant in the Kinderscout Grit and Rough Rock. Some fragments obtained from the Plompton Grit at Knaresborough proved to be a peculiar silicified oolitic rock, the outlines of the oolitic grains being traced out by small rounded bodies stained red or brown. A few pebbles show undoubted traces of organisms such as sponge spicules, etc.

The heavy minerals of the grit are not numerous, the most plentiful being zircon and garnet. The felspars in the grit, both large and small, are quite fresh when first exposed, and this suggests either disintegration of the parent rock by differences of temperature and rapid transportation, or comparative absence of carbon dioxide in the atmosphere. The author has been much impressed by the many points of similarity existing between the Millstone Grit and the Torridon Sandstone, and is disposed to think that areas of similar rock types were laid under contribution for each.

——: o :——

A portrait and obituary notice of the late Robert Shelford, appear in *The Entomologist's Record*, Vol. XXIV, No. 9.

Mr. W. Lower Carter gives an admirable account of the 'Geology at the British Association' in *Nature*, for October 17th.

The *Hull Literary Club Magazine*, just issued, contains a charming address on 'The appreciation of Nature," by the late R. H. Philip; one of the last papers that he wrote.

Mr. Claude Morley gives a brief account of an insect-collecting trip to Lincolnshire recently, when a week's 'bag' contained eighteen hundred specimens. (*The Entomologist*, No. 592).

As a new variety of *Parnassia palustris* (var. *condensata*), described in the *Journal of Botany*, is not figured in that publication, an illustration and brief description appears in *The Lancashire Naturalist* (No. 53).

In *The Zoologist* (No. 855), Mr. Riley Fortune points out that formerly it was a common thing in Yorkshire to see starlings perched on the backs of sheep, etc., but that the habit is not so prevalent nowadays.

Unless it is a misprint, we are not quite sure of the meaning of a reference in the *Lancashire Naturalist* (p. 191) to 'the seige of the brain cavity,' and in the same paragraph a prominent Zoologist is referred to as 'Lyddiker.'

In *The Entomologist's Record* for October, is figured and described 'A Gynandromorphous specimen' of *Amorpha populi* L., that is to say, one half of the moth presents all the characters of the male, and the other half, the characters of the female.

In addition to an admirable report on 'Scottish Marine Fisheries, 1898-1912,' by Prof. McIntosh, we found the following piece of 'poetry' in the October *Zoologist*, which, we will admit, was a little unexpected !—

'And now, me bhoy, hould up yer head
And look like a gentleman, sor;
And tell me where Suleskerry is.
You can tell me if you'll try, sor:
O, there nivver wasn't no such place,
And its all a bluidy loi, sor.'

THE GENUS TRICHOLOMA.

ALFRED CLARKE,
Huddersfield.

THE genus Tricholoma was consitituted by Fries in his ' Systema Mycologicum,' published in 1821. As one of the white-spored subgenera of Agaricus, it is distinguished from other white-spored subgenera principally by the sinuate gills which are neither decurrent as in Clitocybe, nor adnexed or adnate as in Collybia, but have a more or less sudden curve or sinus at the end of the gills nearest the stem, and in some species a short tooth which runs slightly down the stem.

This sinuate gill character is very distinct in most of the species, though in some it is not quite so definite, consequently reference must also be made to certain other characters of the group for the determination of the species.

The position assigned by Fries to this group corresponds to Entoloma, with pink spores, Hebeloma, with brown spores, and Hypholoma, with purple spores.

There is nothing remarkable in the form of any of the Tricholomas, the shape of all the species being fairly uniform in general build, the only difference being in size.

The prevailing colour is yellow, yellowish-brown, and brown, a few species are lilac or purplish, there are no intensely red or scarlet species as in the Russulas. They are mostly of a robust build, having a fairly thick, fleshy pileus and a short stout stem. None are what may be termed small. None have any trace of a volva at the base of the stem ; nor is a ring ever present, or a true veil, though sometimes there is a slight veil-like floccose appendage adhering to the margin of the pileus in the form of a fringe. It is from the latter character the group received its name, *trichos*, a hair ; *loma*, a fringe.

The pileus is never conical in outline nor truly umbilicate. The stem, which is central and usually solid, is fibrously fleshy throughout ; it is homogeneous and confluent with that of the Hymenophorum, that is to say, the flesh which is composed of a compacted bundle of fibres or strands of hyphae are arranged lengthwise and continuous throughout the substance of the stem and the pileus. In this it differs from, say Lepiota, in which genus there is a distinct differentiation of the strands at the apex of the stem where, in most species of Lepiota, the stem fits into the pileus after the manner of a ball-joint, and may be easily removed without apparent tearing of the tissue.

The surface of the stem is not hard, smooth and polished as in Mycena, Collybia, etc., but more or less loosely fibrous.

The gills are somewhat distinct from the pileus and in certain species separate from it as readily as in the genus *Paxillus*.

All the species of Tricholoma, with three exceptions, are terrestrial, growing on the ground; the exceptions are:—*T. variegatum*, on rotten wood; *T. immundum*, a rare species grows on sheep-dung; *T. sordidum*, about manure heaps. The larger of the remaining species mostly grow in woodlands, the smaller in pastures.

Most of the species are autumnal, some late. A small group, of which *T. gambosum* is the type, are vernal, though occasional specimens may be found during summer and early autumn. *T. gambosum* comes in April, about St. George's day, hence called St. George's 'mushroom'—a good substantial edible species; others of this group, including 'Blewits,' have also long been considered special delicacies, having a pleasant odour like new flour. None are known to be truly poisonous, though a few are rank and suspicious, and have such objectionable qualities that they are not likely to be tried as edibles. Economically none are under any ban as being destructive, for one reason perhaps, because none grow on living trees as is the case with some Agarics.

In point of number of species this is the largest of the white-spored groups, and with the exception of Cortinarius, is the most extensive genus in the whole range of the Order Agaricaceae. Altogether about 200 species and a few varieties have been described. 137 of these have been met with in Europe, 113 in Great Britain, 68 in Yorkshire, and 41 in the Mulgrave district. 12 of the latter were, when found, new to Yorkshire. *Tricholoma onychinum* Fr. and *T. fallax* Peck. were first British records.

Fries divided the genus into seven classes in which the character of the pileus is given primary consideration, as follow:—

1. *Limacina.* Pileus slimy or viscid.
2. *Genuina* (type). Pileus flocculose.
3. *Rigida.* Pileus rigid.
4. *Sericella.* Pileus silky.
5. *Guttata.* Pileus spotted with drop like marks.
6. *Spongiosa.* Pileus spongy.
7. *Hygrophana.* Pileus watery.

Sub-divisions of each of the above sections are made according to minor characters.*

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* The names of the 137 European species were classified under the above headings on seven large sheets hung on the schoolroom walls where they could be seen at a glance and studied at leisure; along with a large number of coloured drawings of the genus. A three column arrangement is added that showed which of the 137 European species have been met with in Britain, in Yorkshire and at Mulgrave. Short remarks were made on the special features or connections of about 70 British species, including the derivation of many of the technical names.

MYCOLOGY, NEW AND OLD.

GEORGE MASSEE, F.L.S., V.M.H.

Up to comparatively recent times, morphological or structural characters, obvious to the unaided eye, or aided by a pocket-lens, were solely used in the discrimination of species included in the large group of fungi known as the Basidiomycetes. Fries, the founder of modern mycology, invariably used such characters, and also insisted on the necessity of taking the mean of several features or characters presented by different parts of the plant for embodying his conception of a species. There are certain features that stand out in most species which, when once mastered, cannot be mistaken. This standpoint, of course, can only appeal to those mycologists who are familiar with the fungi as seen in their native habitats, and who, by experience gained under such conditions, have learned the direction and range of variation exhibited by each species. From this standpoint it obviously follows, that mycologists of the above nature, are not particularly impressed by what are known as *type* specimens, but would rather be inclined to assert that no one specimen embodies all the features that constitute the species under consideration, hence such mycologists are inclined to be more charitable in their view as to what constitutes a species, than are those whom I may designate as belonging to the new school of systematic mycologists.

To the latter class belong those who, at a rule, have had considerable experience in botanical work generally, as conducted in a modern laboratory, where the microscope has to be utilised on all occasions If, as sometimes happens, men so trained, turn their attention to systematic mycology, the microscope, from beginning to end, is their sheet-anchor, and dried or spirit specimens constitute the material on which their arguments and deductions are based. Life, with its potentialities is a factor, due to circumstances, left out of consideration, and the dried and mummified individual specimen becomes a *type* presenting features as sharply defined as the acknowledged fixed points used in chemistry and physics, and the mycologist of this stamp proceeds as if he was solving a mathematical problem. If a specimen does not conform with the type in all particulars, it is something else, and in the majority of instances has to be made a new species. This is true, even when more than one factor is taken into consideration. But some members of the modern school work on narrower lines. There are not wanting those who swear by the size of the spores alone, other factors being sometime noted as a rider. Others again, consider that the true secret as to what constitutes a

species, can only be determined by the use of chemical re-agents. The great drawback to the last mentioned method is the necessity for knowing accurately the birthday of the fungus to be tested, as the substances yielding the required re-actions, are only present at a certain stage in the growth of the fungus.

From the above account it will be gathered that the mycologist of the modern school, has of necessity to create more new species, in working from a single, fixed type, than the older fraternity, who, rightly or wrongly, admit that there is a latitude of variation in practically every species. Finally, I am not aware that any one has demonstrated that in the Basidiomycetes, microscopic characters are less variable in form and dimensions, etc., than are the macroscopic characters. The invariable size of spores in a given species, upon which so much stress has been laid by certain observers, was questioned many years ago by Dr. M. C. Cooke, and his views have been corroborated by some striking observations recently made by my colleague, Mr. A. D. Cotton, of Kew, who, in due course, will give an account of his discovery in this matter.

Which of the above systems is more in accordance with nature, time alone will prove, perhaps the mean will commend itself to most.

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A NEW BRITISH HEPATIC (*CEPHALOZIELLA PULCHELLA* C. JENS.).

WM. INGHAM, B.A.

On 28th September, 1908, I found on the moist bed of a ditch on Skipwith Common, E. Yorkshire, a very small hepatic which I knew to be a Cephaloziella. It was unlike any known British species of the above genus. I sent a specimen of it to Mons. Douin of Chartres, France, an acknowledged expert on the difficult genus Cephaloziella. On the 9th November, 1912, he replied, 'The plant you kindly sent me is a very fine form of *Cephaloziella pulchella* C. Jens., much better characterized than the original gathering of Jensen.'

The plant was first found in 1893 by C. Jensen, near Skagen, at the extreme North of Denmark, and also on the bed of a ditch. It is described as a new species, accompanied by a fine full paged plate in the *Revue Bryologique*, for 1893. The existence of this plant on opposite sides of the North Sea is of interest.

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From the Report of the Curator of the Stockport Museum, recently issued, it appears that the usefulness of the museum is increased by visits of children from the Schools. There is also a table on which the local wild flowers are exhibited.

YORKSHIRE MARINE BIOLOGY COMMITTEE AT ROBIN HOOD'S BAY—OCT. 12-14.

F. H. WOODS.

As far as shell-molluscs are concerned, the meeting at Robin Hood's Bay must be pronounced a great success. The conditions of tide and weather were excellent. Robin Hood's Bay is an ideal hunting ground in low spring tide, and the presence of our Chairman, Professor Garstang, added an additional zest. Perhaps the most striking feature was the large number of Chitonids. Of these no fewer than 5 distinct species were found. One of them, discovered by Professor Garstang, was identified by Mr. Sykes, of Weymouth, as *lævis*. The other, found by Miss Cooper, of the Vicarage, Fylingdale, proved to be *onyx*, surely a more appropriate name than *asellus*, 'a young ass.' The other three more familiar species were found in considerable numbers. Another interesting feature was the number of borers or quasi-borers, which had made their way into, or in the crevices of, the soft lias; such as, of course, *Zirphæa crispata*, *Saxicava* and *Modiolus*, in a very hairy condition, accounting no doubt for many of the records of *barbatus* and *phasiolinus* on our coast, *Kellia* and many others. One great advantage of this shore is that a worker can go out at low spring tide to the very edge of the laminarian zone without any danger of being caught by the tide. The shell sand also proved full of interest. Among the most striking specimens was that of *Lepeta fulva*, a very minute shell of which species I found at Scarborough last year, and so identified with some hesitation, as it had not been apparently recorded for the Yorkshire coast. It is given neither by Mr. Hargreaves in his list in the Conchological Journal, July, 1910, nor Mr. Theakston in his guide to Scarborough, in which the list of marine molluscs is said to have been drawn up by Bean. But the specimen which I found at Robin Hood's Bay is quite unmistakeable. Another very interesting shell is *Ondina obliqua*, of which I found 2 specimens. It has hitherto, according to Mr. Hargreaves, been only recorded for Scarborough, where, in fact, I obtained two small specimens this year. It is a shell, however, of a wide distribution. I have found it in such widely different localities as Lerwick, Shetland, Holy Island, Northumberland, and Whitesand Bay, Lands End. *Gibbula tumida*, though common enough in the south, as at Tenby, I have not found before on the Yorkshire coast. *Bela trevelyana* is also a very local species. Some of the records were probably worn specimens of the common *turricula* which is often confused with it. As a result of the meeting at least five new species will be added to the Hull Museum collection.

As regards other branches of marine biology, Dr. Irving

writes :—'Absence of distinctive rock-pools and cavernous ledges, as well as a minimum of mud and sand militates against Robin Hood's Bay as an ideal spot for marine organisms in general. Nevertheless, at low Spring-tide, such as we experienced, with a calm sea, the semi-tide pools lying between the liassic reefs running out at right angles from the shore are full of possibilities, and provided practically all the non-conchological specimens in this list. Although there is no new species to record this year, as far as my investigations went, the variety of organisms found in the hour or two was considerable. The *Botryllus* patches were fine and Echinoderms plentiful—indications that the neighbourhood is good for marine work. A single morning's hunt is hardly sufficient to form a sound judgment of what may or may not be found there.'

The following list was drawn up by Dr. Irving and myself, I claim responsibility for the shell-molluscs, Dr. Irving for the rest :—

PORIFERA (Sponges).
Halichondria panicea.
Grantia compressa.
Leucosolenia botryoides.
Leuconia nivea.
HYDROZOA (Zoophytes).
Sertularia pumila.
Obelia geniculata.
Clava multicornis.
ACTINOZOA (Anemones).
Actinia mesembryanthemum.
Tealia crassicornis.
Sagartia troglodytes.
Sagartia pura.
VERMES (Worms).
Lineus marinus.
Nemertes neesii.
Nereis cultrifera.
Nereis pelagica.
Lepidonotus squamatus.
Harmothoë imbricata.
Audouinia tentaculata.
Cirratulus cirratus.
Potamilla torelli.
Sabellaria spinulosa.
Pomatoceros triqueter.
MOLLUSCA (Shelled).
**Tonicella rubra.*
**Callochiton lævis.*
**Craspedochilus onyx* (*asellus*).
* ,, *cinereus* (*marginatus*).
* *Acanthochites fasciculatis.*
Nucula nucleus.
,, *nitida.*
Nuculana minuta (*candata*).
*† *Anomia ephippium.*
,, *patelliformis.*
**Mytilus edulis.*
**Volsella modiolus.*
†*Modiolaria marmorata.*
† ,, *discrepans* (*nigra*).
Ostrea edulis.
Pecten pusio.
† ,, *varius.*
† ,, *opercularis.*
† ,, *tigerinus* (fragment).
† ,, *similis* (imperfect).
**Turtonia minuta.*
Astarte compressa.
Montacuta bidentata.
Tellimya ferruginosa.
* *Kellia suborbicularis.*
†*Lasæa rubra.*
†*Syndosmya nitida.*
,, *alba.*
Tellina tenuis (fragment only).
† ,, *fabula.*
Donax vittatus (fragment only).
†*Mactra stultorum.*
†*Spisula solida.*
†*Venus gallina.*
**Tapes pullastra.*
* ,, v. *perforans.*
†*Cardium echinatum.*
† ,, *fasciatum.*
† ,, *edule.*
**Mya truncata.*
**Saxicava rugosa*

NOTE.—An asterisk (*) prefixed to a name signifies that the animal was found alive ; a dagger (†) that it was only found in a very young state.

Mollusca (Shelled)—*contd.*
**Saxicava arctica.*
**Zirphæa crispata.*
**Patella vulgata.*
** ,, depressa.*
** Helcion pellucida.*
Acmæa testudinalis.
** ,, virginea.*
Lepeta (Acmæa) fulva.
Eumargarita helicina.
†*Gibbula tumida* (fragment only).
** ,, cineraria.*
Calliostoma zizyphinum (fragments only).
**Lacuna divaricata (vincta).*
** ,, pallidula.*
**Littorina obtusata.*
** ,, rudis.*
** ,, littorea.*
**Rissoa parva.*
** ,, v. interrupta.*
Alvania punctura.
**Onoba striata.*
Setia obtusa. (?)
Cingula semistriata.
Skenea planorbis.
†*Capulus hungaricus.*
Trivia europæa.
†*Natica alderi.*
**Velutina lævigata.*
Odostomia unidentata.
,, turrita.
Brachystomia albella. (?)
,, rissoides.
Ondina obliqua.
Pyrgulina indistincta.
,, interstincta.
Spiralinella spiralis.
**Buccinum undatum.*
Neptunea antiqua.
Tritonofusus gracilis.
**Purpura lapillus.*
**Nassa incrassata.*
Bela turricula.
,, trevelyana.
**† Bela rufa.*
†*Clathurella linearis.*
Tornatina truncatula.
Diaphana hyalina.
Philine catena.
,, punctata.

Mollusca (Nudibranchs).
Archidoris tuberculata.
Jorunna johnstoni.
Lamellidoris bilamellata.
Lamellidoris aspera.
Acanthodoris pilosa.
Doto coronata.
Goniodoris nodosa.
Triopa clavigera.
Aeolidia papillosa.

Echinodermata.
Echinus sphæra.
Echinus miliaris.
Asterias rubens.
Cribella oculata.
Solaster papposus.
Ophiura ciliaris.
Ophiocoma rosula.

Crustacea.
Balanus balanoides.
Gammarus marinus.
Mysis chamæleon.
Caprella linearis.
Pagurus bernhardus.
Carcinus mænas.
Cancer pagurus.
Maia squinado.
Porcellana longicornis.
Pinnotheres pisum.
Galathea squamifera.

Pycnogonida.
Pycnogonum littorale.
Phoxichilidium coccineum.
Phoxichilus spinosus.

Tunicata.
Cynthia aggregata.
Botryllus smaragdus.

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We are not certain whether the editor of *The Naturalist Photographer* is 'getting at' us in his current issue. He says 'The Walrus and the Editors of *The Naturalist* (irresponsibility and dignity hand-in-hand have slipped on the thin ice of ignorance and great was the fall thereof !) have, to say the least of it, got a "bit mixed."' We don't know what sin the wonderland walrus has committed to so enrage Mr. Carl Edward's wrath ; in our own case we merely stated that the extraordinary difficulties and hair-breadth escapes of nature-photographers, as related by themselves, were often exaggerated ; and we repeat that it is quite possible to get successful photographs of birds and nests without dressing oneself up as a bull or disguising oneself as a crab-apple tree, and also without hanging on to the end of a piece of string for several hours. We have nature-photographers among our contributors who have produced very successful prints, and they are quite ordinary mortals.

Naturalist,

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In *The Scottish Naturalist* for November, Mr. J. Waterston has an illustrated paper on *Mackayia dimorpha*, a New Genus and Species of Mallophaga from the Manx Shearwater.

The Animal World (No. 81) contains an article on 'Animals of a Bygone Age,' by H. J. Shepstone. It is illustrated by photographs of specimens in Hagenbeck's Zoological Gardens at Hamburg.

In *The Journal of the Board of Agriculture* for October, Dr. R. S. MacDougall contributes an illustrated paper on Willow and Poplar Leaf Beetles, and Mr. G. Massee describes 'The Presence of Tubers on Potato Haulms.'

REVIEWS AND BOOK NOTICES.

The **Summary of Progress of the Geological Survey** for 1911, contains particulars of recent work in the Cheshire area.

Cruelties in Dress (8 pp. 2d.) is the title of a pamphlet issued by the Animals' Friend Society, London. It is written by Jesse Wade, and refers to the cruelties practiced on animals in order to secure adornments for the 'gentle' sex.

Leisure Hours with Nature. By **E. P. Larken.** London: Fisher Unwin. Cheap Edition, 263 pp. 2/- net.

This cheap volume contains thirty-two articles on nature study subjects, many of which have previously appeared elsewhere. They cover most branches of natural history—birds, mammals, flowers, climate, reptiles, moths, folk-beliefs, etc., etc. There are some dozens of excellent illustrations from photographs, mostly of birds and their nests. The book would make an excellent school prize for elder scholars.

The Voyage of the 'Discovery.' By **Capt. Robert F. Scott,** 2 Vols., pp., 410 and 387. London: Smith, Elder & Co., 1912.

We are delighted to find that the publishers of this charming work have published a 're-issue' in a cheap form, as it will now enable many to have the book on their shelves who were previously not in a position to do so. We feel sure it is unnecessary to describe to our readers the valuable nature of the contents of this work, and the various chapters bearing upon different branches of natural and physical science. The book has certainly found a prominent place among the many valuable records of the work of Englishmen in the more inaccessible parts of our globe. The numerous plates, photographs, and maps are all reproduced in this cheap edition.

Wild Life in the West Highlands. By **C. H. Alston,** Glasgow: James Maclehose, 271 pp., 6/- net.

Those who read *The Scotsman* will be familar with Mr. C. H. Alston's well-written articles dealing with 'Wild Life in the West Highlands,' and will welcome them in the present more permanent form. They deal with the Wild Cat, Badger, Grey Seal, Stoat, and various species of birds, which the author has had opportunity of watching in the wilds of Scotland. There are other chapters of more general interest, dealing with the recent increase and dispersal of birds, birds and their changing habits, etc., which will appeal to field naturalists. As an appendix are papers on the Elephant at Home, and the Kea, which seem rather out of place. There are a number of suitable illustrations, among which we notice a fine little sketch of a skin of the wild cat, by our contributor, Mr. C. G. Danford.

Science of the Sea. Edited by **G. H. Fowler.** London: John Murray, 452 pp., 6/- net.

This is an 'elementary handbook of practical oceanography for travellers, sailors, and yachtsmen,' which has been prepared by the Challenger Society in order to further the study of oceanography, and there can be little question that this most laudable object will be fulfilled. We know from practical experience that sailors and others are frequently only too glad to be of service to naturalists, if they are informed in what way their energies may be directed. It is not always an easy matter to briefly explain to them what is required, but in the present book this is done in a simple and interesting manner. The various questions upon which information is desired are fully explained, and hints are given on collecting and preserving different forms or marine life. There are over 200 illustrations of marine objects, charts, diagrams, etc. We know of no more suitable present to an educated sailor, or to anyone likely to spend some time on the water, than this present volume; and certainly a copy should be in the library on board every passenger steamer.

How to attract and Protect Wild Birds, by **M. Hiesemann**, published by Messrs. Witherby & Co., has reached a third edition. The new issue has much additional information and many new illustrations. Anyone desirous of encouraging the birds to build in their gardens should read this little book.

The Individual in the Animal Kingdom. By **Julian S. Huxley.** Cambridge University Press, 167 pp., 1/-.

In this little volume the author defines the Individual as a ' continuing whole with inter-independent parts,' and tries to show in what ways Individuality, as thus defined, manifests itself in the Animal Kingdom. The chapters deal with the Biological Foundations of Individuality, some other definitions of Animal Individuality, the Second Grade of Individuality and its attainment, the Later Progress of Individuality, the Relation of Individuality to Matter, etc. Among the illustrations are *Volvox globator*, the River Fluke, Hydra, *Gonium*, etc.

York: From its origin to the end of the eleventh century, by **G. Benson.**

We have had this interesting volume before us some little time. Those who have an opportunity of following the work carried on at the most important archaeological centre in the country, will have noticed to what a large extent this is due to the energy of Mr. Benson. Oddly enough he is one of the very few at York who take a deep interest in the history of their ancient city. Whenever excavations have been made, Mr. Benson has taken careful measurements and photographs, his profession as an architect standing him in good stead. The result is that he has obtained much useful information relating to the earlier chapters in York's history, which would certainly otherwise have been lost. The present book contains these details, illustrated by blocks from photographs, and also by numerous folding maps and plans, which form a remarkably valuable feature.

The Story of the East Riding of Yorkshire. By **H .B. Browne.** London : A. Brown & Sons, 352 pages, 3/6.

Himself the master of a Secondary School, the author of this work has authoritatively prepared a volume to be used by the more advanced scholars, and we are pleased to find they are doing so ; and the work will also appeal to those who are only able to sigh for their school days again. Beginning with the geological structure of the Riding, the author takes his readers step by step through the Pre-historic, Roman, Danish, Norman, etc., etc., times, to the present day. And each chapter is illustrated by a profusion of figures from photographs or contemporary sketches or prints. Probably more than in the case of any other volume of this kind, has Mr. Browne demonstrated the great educational value of museum collections ; by far the greater proportion of his illustrations being drawn from the York, Driffield or Hull Museums.

The Heritage of Dress. By **Wilfred Mark Webb.** London : The Times Book Club, 299 pages, new and revised edition, price .

We feel sure this volume will appeal to our readers, as it deals strictly with the question of evolution,and ' survivals,' though as applied to clothes. In a remarkably fascinating manner Mr. Mark Webb refers to the gradual growth and evolution of clothes, and by the aid of nearly two hundred illustrations he shews the changes that have taken place from the time of the ' very early man in Java,' who is represented as wearing the same clothes as do present-day monkeys ; and from negroes dressed in bracelets, to a Siamese princess in silk trousers. Among many interesting survivals illustrated and described are the ' nicks' in coats and waistcoats, the buttons on coat-tails, bands and band-boxes, ' clocks ' on stockings, wigs, cockades, etc. There are also valuable chapters on the evolution of the uniforms of the army and navy, the vestments of the clergy, horse trappings, etc. It is one of the pleasantest books we have read for some time.

For Love of Beasts, is a pamphlet issued in the interests of our animal friends, by the Animals' Friend Society, of York House, Portugal Street, Kingsway, London. It is by **John Galsworthy,** and is sold at twopence.

The Growth of Groups in the Animal Kingdom. By **R. E. Lloyd.** Longmans, Green & Co., 1912. 185 pp., 5/- net.

In the opinion of the author, who is connected with the Indian Medical Service, this book contains ' an assortment of personal opinions, most of which are borrowed from well-known sources,' and is ' not in the least a review of the present position of biology,' and with this opinion we cannot disagree. His point is that ' groups of like animals, such as are small in membership and temporary in duration, are common in nature. A large part of the book deals with the origin, fate and significance of such groups,' The author also informs us that the book ' deals with the subject of evolution in a somewhat discursive manner,' and with this we also agree. As a frontispiece is an excellent coloured pate of ' Varieties of *Mus rattus.*'

British Violets. By **Mrs. E. S. Gregory.** Cambridge: Heffer & Sons, pp. xxiii. and 108, 6/- net.

Although this is essentially a book for the specialist, there is a touch of human interest in it which will appeal to a much wider circle. It is one of those little volumes which show so clearly how much enjoyment may be obtained form the study of wild flowers, ' even so late as June of the present year a day on the rough fen made me feel young again in spite of my seventy years.' We are further told that the work has been done in hours of recreation, not a man's recreation, for we are reminded that ' a man's work ends with the sun ; a woman's work is never done,' yet in these rare moments Mrs. Gregory has brought together a mass of valuable details about violets, which, as every field botanist knows, are plants which provide him with endless puzzles. Another pleasure is recalled in the associations of quarter of a century or more, with kindred spirits in different parts of the country, all able and willing to help unsparingly with the work ; one friend generously financing the book through the press. In the 108 pages only the Nominium Section is dealt with and this includes 12 species and very many varieties, forms and hybrids, *e.g.*, those under *canina* and *Riviniana* have about 20 pages each devoted to them. Several new varieties and forms are described. *V. Riviniana* var. *divisa* and two new varieties of *canina*, viz., *pusilla* and *calcarea* are illustrated by photographs of herbarium specimens, so also is *V. calcarea* Gregory. Other forms are illustrated in 14 full page figures clearly drawn by Miss Mills, there are also 14 text figures. The book is clearly written and well printed ; the synonyms are full and the forms have been carefully compared with continental plants and an effort made to bring them into line, a by no means easy task. The confusing variety, due in some measure to the readiness with which they hybridise, may be illustrated by a series of intermediates between *canina, lactea* and *Riviniana* from Kynance Downs, Cornwall, which posesss the habit of one species, the leaves and stipules of a second, the flowers of a third, in an infinite variety of combinations. An unusual form of ' common ' name is introduced for some of the varieties, *e.g.*, *V. canina* × *sylvatica* (agg.) is Mrs. Jenner's White Dog Violet, ' another (var. *lanceolata*) is Mr. Druce's Violet, while ' Miss Pallis's Violet ' has no varietal name. Evidently the work has been based mainly on material collected in the Southern half of England and in Ireland. North of England and Scottish forms are rare or absent, one of the few mentioned is the ' Teesdale Violet,' *V. rupestris* var. *arenaria* from Cauldron Snout. There is thus plenty of scope for Northern botanists to examine the violets in the light of this monograph and thereby greatly extend the range here indicated. Mr. G. Claridge Druce has written an introduction to the volume in which he outlines the progress of our knowledge of these favourite plants from the 16th century to the present day.—T.W.W.

Messrs. T. C. and E. C. Jack have issued a remarkable series of neatly bound volumes known as 'The People's Books,' at the extraordinarily low price of sixpence each. Two of these are before us, viz., **Embryology, the Beginnings of Life,** by **Dr. Gerald Leighton,** and **The Evolution of Living Organisms,** by **Mr. E. S. Goodrich, F.R.S.** The names of these authors are sufficient guarantee for the reliability of the volumes.

Spiders. By **Cecil Warburton.** Cambridge University Press, 1912, 136 pp., 1/- net. The interest that has been taken in recent years in the usually neglected order, the arachnida, has been most satisfactory, and no doubt Mr. Warburton's excellent introduction to their study, just issued in the Cambridge Manuals of Science and Literature, will do much to further the claims of this fascinating branch of natural history. After describing the various forms of spiders, and their extraordinary habits, the author deals with their enemies, parasites, etc. The book is well illustrated.

Butterflies and Moths at Home and Abroad. By **H. Rowland-Brown.** London: Fisher Unwin, 1912., 271 pp., 7/6 net.

By the aid of 21 excellently coloured plates on tinted mounts, and diagrams in the text, Mr Rowland Brown not only gives an account of the more important genera and species of butterflies and moths, but has eight introductory chapters which will prove useful to the beginner. These deal with the use of collecting and observation; entomology, its meaning; the egg, the larva, the pupa, the perfect insect; classification, rearing and breeding, killing, setting, storing, distribution, immigration, colonisation, protective powers, mimicry, etc. The book will be found most useful to a beginner, and the plates are very good.

The Marine Mammals in the Anatomical Museum of the University of Edinburgh. By **Sir William Turner, K.C.B.** London: MacMillan and Co., 207 pp., 6/- net.

Some time ago the present writer had the rare privilege of being conducted round the wonderful collection of marine mammalia in the Museum of the Edinburgh University, by Sir William Turner, and was astounded at the marvellous amount of material which is there available for students in this usually neglected branch of zoology. During a long and most energetic life Sir William has been successful, almost single-handed, in gathering together an unrivalled series of objects representing 33 species of cetacea, varying from 66 feet or so long, to hand specimens. The present work is not merely a well prepared and well illustrated catalogue of the specimens at Edinburgh, but it forms a valuable contribution to our knowledge of the larger mammalia. Sir William's 'Introduction,' though only consisting of 20 pages, is remarkably clear and concise, and not only summarises what is known of modern whales, etc., but includes an instructive description of the fossil forms.

The Naturalist in Siluria. By **Capt. Mayne Reid.** Cheap Edition, Price 2/-. Published by The Year Book Press.

Siluria, where Capt. Mayne Reed resided, is a district in Herefordshire and Gloucestershire covered by the Upper Silurian Rocks. It is described by Capt. Reed as a naturalist's paradise, and the book consists of a series of essays, chiefly concerning the vertebrate fauna of the district. Many of them are extremely interesting, and prove Capt. Reid to have been a keen and observant naturalist. There are, however, one or two anomalies. For instance, the author falls foul of certain scientific nomenclature, and especially with *Garrulus glandarius*, in connection with the Jay (we wonder what he would think of the present day tinkering with nomenclature), yet in another place he suggests a new name for the Hedge Sparrow calling it the Hedge Threader!! One cannot agree with him in his statement that newts are 'hideous creatures,' nor that the 'wicked little bullhead' (*Cottus gobio*), bites 'like a very shark.' The book is a suitable gift for a young nature lover.—R. F.

The Pre-Historic Period in South Africa. By **J. P. Johnson**, Longmans, Green & Co., 1912, second edition, 115 pp., 10/- net.

In this work the author is thoroughly up to date in his methods of classification of the various stone implements, but whether the Eolithic, Acheulic, Solutric, etc., types and dates can be expected to hold good in distant South Africa is a matter for future investigations to decide. Anyway a start has been made by Mr. Johnson. The present edition contains new information in reference to the Coast Middens, and also in regard to the early Bantu buildings. There are likewise interesting notes on the petroglyphs, *i.e.*, rock-paintings and rock-carvings, which will be of interest in view of similar discoveries recently made nearer home. There are many illustrations in the volume, and a map shewing the distribution of stone-age implements in South Africa, so far as is at present known.

Origin and Antiquity of Man. By **G. Frederick Wright, LL.D., etc.** Bibliotheca Sacra Company, Oberlin, Ohio, 547 pp., 2/- net.

English readers are already familar with Prof. Wright's excellent work on *Man and the Glacial Period*, which was issued in the International Scientific Series. Since then Prof. Wright has travelled much, and has visited many parts of Europe and Asia in connection with his studies. He was already familiar with the American evidence, consequently he is able to speak on the subject given in the title of the new volume with exceptional authority. From his book, and also from the excellent bibliography which he gives, it is apparent that he has made himself thoroughly familiar with modern writers on the subject, in fact he gives many references to papers etc., issued during the present year. Among the many matters discussed are the Historical evidence of Man's Antiquity, the Origin of the Races of Europe, the Significance of the Glacial Epoch, Remains of Glacial Man in Europe, the Psychological Argument, the Biblical Scheme, etc. The Chapters dealing with the Glacial Period and Man's first appearance upon our planet are particularly valuable, inasmuch as they contain much new information. It is satisfactory to find that Prof. Wright considers that the evidence of Tertiary Man is by no means conclusive. The work is written in the author's charactersitically lucid style, and will appeal with equal force to the novice and the specialist.

The Early Naturalists: Their Lives and Work (1530—1789). By **L. C. Miall, D.Sc., F.R.S.** MacMillan and Co., 1912, 396 pp., 10/- net.

In this volume Dr. Miall deals with a multitude of early writers in Natural Science, the names and work of which are familiar to most modern students. He also includes particulars of the achievements of some who are little known to present-day scientists. Turner, Gerrard, Ray, Caius, Martin Lister, Swammerdam, Leeuwenhoek, Linnæus and Buffon are among the many. Here and there, however, a slight change in the style of the work occurs, as for example, in the chapter on 'The investigation of the Puss Moth,' which is sandwiched in between the accounts of von Rosenhof and Linnæus. Throughout, as might have been expected from the nature of Dr. Miall's work, prominence is given to the investigators among insects. It must be borne in mind, however, that this is not entirely due to the particular inclination of the author's favourite study, as, next perhaps to plants, insects occupied much of the attention of early workers. Entomologists particularly will welcome the present volume, but it will be found interesting and instructive to students in other branches, as well as to those who are not specially interested in any one subject. In one or two instances we are inclined to think that the descriptions of the work of these early naturalists are rather prejudiced, and even we might say that these pioneers do not always quite receive the full credit and praise to which they are entitled. But this is probably the result of viewing work of the sixteenth and seventeenth centuries through twentieth century spectacles.

The Love of Nature among the Romans. By **Sir Archibald Geikie, K.C.B., etc.** London: John Murray, 1912, 394 pp., 9/- net.

In this truly charming volume, the President of the Royal Society deals in his characteristically delightful fashion with nature study during the later decades of the Roman Republic and the first century of the Empire. At that early period it might at first be thought that little would have been known, and that even less record of that little would be available. But Sir Archibald, although he has gone thoroughly into the matter (as indeed he does with anything he undertakes), proves that even after he has dealt with the subject to considerable length, it is not exhausted. The volume is really founded on the author's presidential address to the Classical Association, and, unusual though the subject was to that august body, we will undertake to say that Sir Archibald's address was as lucid and learned, and as fascinating to its members, as any address delivered to the Association. The author opines that 'the classical scholar who may look over its pages will probably find in them nothing with which he is not already familiar, though it may not have occurred to him to collect and compare the scattered passages in Latin authors which reveal how far and in what ways these writers were influenced by the features of the external world.' To the ordinary reader, however, he hopes the book may be of some interest 'to see the familiar aspects of Nature as they appeared to Roman eyes and appealed to Roman hearts nineteen hundred years ago.'

Studies in Bird Migration. By **W. Eagle Clarke.** London: Gurney and Jackson, 1912, 2 vols., pp. 339 and 354, 18/- net.

We should like to sincerely congratulate our friend Mr. Eagle Clarke, a past-president of the Yorkshire Naturalists' Union, upon the completion of this great work. From the earliest times the questions arising in connection with the migrations of birds have occupied the attention of naturalists and others, and for a considerable time, and particularly in recent years, has the question been prominently before the scientific world. There have been books and papers and addresses innumerable, and theories almost as many, but the subject has wanted more careful thought, the various views have required analysing, and the multifarious records and observations, digesting and summarising. Few had the necessary ornithological knowledge and experience to undertake the task in a thorough and comprehensive manner. None, except the author, had spent the enormous amount of time in lonely lighthouses and lightships necessary to get a thorough grasp of the problems connected with the extraordinary movements of the birds. Cordeaux, another past-president of the Yorkshire Union, first inspired the author to take an interest in bird migration. Would that he were still with us to share our pleasure at the completion of the present work. In 1883, Mr. Eagle Clarke was elected a member of the British Association Committee on Bird Migration, and, as our readers will recollect, he was entrusted with the preparation of the five reports embodying the results of that great enquiry. Still, the author felt that there were many directions in which information was wanted, and to gain this object he spent no fewer than forty seven weeks in various lighthouses and in a light-ship, and fourteen weeks on the remote islands of St. Kilda, and Ushant. Mr. Eagle Clarke first gives a good account of ancient and antiquated views upon the subject, and an excellent summary of the various modern views. In addition to his descriptions of his sojourns at his various stations of obversation, etc., he has chapters on the migration of the more important species of birds. There are twenty-six chapters in all, and many valuable maps and illustrations. We can safely say that no one is more competent to write a work on bird migration than is our author, and he has done his work well. While it may be that the last word on the subject of bird migration has not been said, there can be no doubt that no future worker will be competent to discuss the question without first having consulted these two magnificent volumes.

Heroes of Science, by **C. R. Gibson.** London: Seeley, Service and Co., 1913, 358 pp., price 5/-.

This book is evidently primarily intended as a prize for advanced scholars, and as such is all that can be wished. It deals with the lives and work of the greatest of our scientific men, the frontispiece appropriately being a portrait of Lord Kelvin, with his compass for use on iron ships. As might be expected, the author refers largely to the physicists, their 'lives, sacrifices, successes and failures.' He also deals with the principal discoveries in science, and well illustrates the extraordinary way in which these bear upon our everyday life. The work includes an account of 'University Professors of two thousand years ago.' and among the other 'heroes' referred to are Copernicus, Kepler, Galileo, Newton, Franklin, Priestley, the Herschels, Dalton, Davy, Faraday, Darwin, Kelvin, Maxwell, etc. The various essays are well written, the type used is good, the cover is gaudy, and the paper is poor.

The Horse and its Relatives. By **R. Lydekker.** London: G. Allen and Co., 1912, 286 pp., 10s. 6d. net.

Some little time ago we had the pleasure of noticing a valuable work on 'The Ox,' by the same prolific writer, and the present may be described as a fitting companion thereto, except, unfortunately, that it is of a different size. But Mr. Lydekker, with his enormous knowledge and his ready access to the National Collections is naturally able to produce a volume with the latest possible information upon any of the various subjects with which he deals. Primarily the present work is intended for the naturalist, but it will also appeal to big-game hunters, antiquaries, horse-breeders, and even racing men. The chapters refer to the Zoological Position and Structure of the Horse, the Wild Tarpan and its relations, Horses and Ponies in the British Islands, Foreign Breeds, Arab horses, Ferel horses, the Kiang and Onager Group, Zebras and Quaggas, the Ass, Mules and other Hybrids, and the extinct forerunners of the horse. The last chapter appeals to us the most. The volume is particularly well illustrated.

British Plant Galls. By **E. W. Swanton.** London: Methuen & Co., 287 pp., 7s. 6d. net.

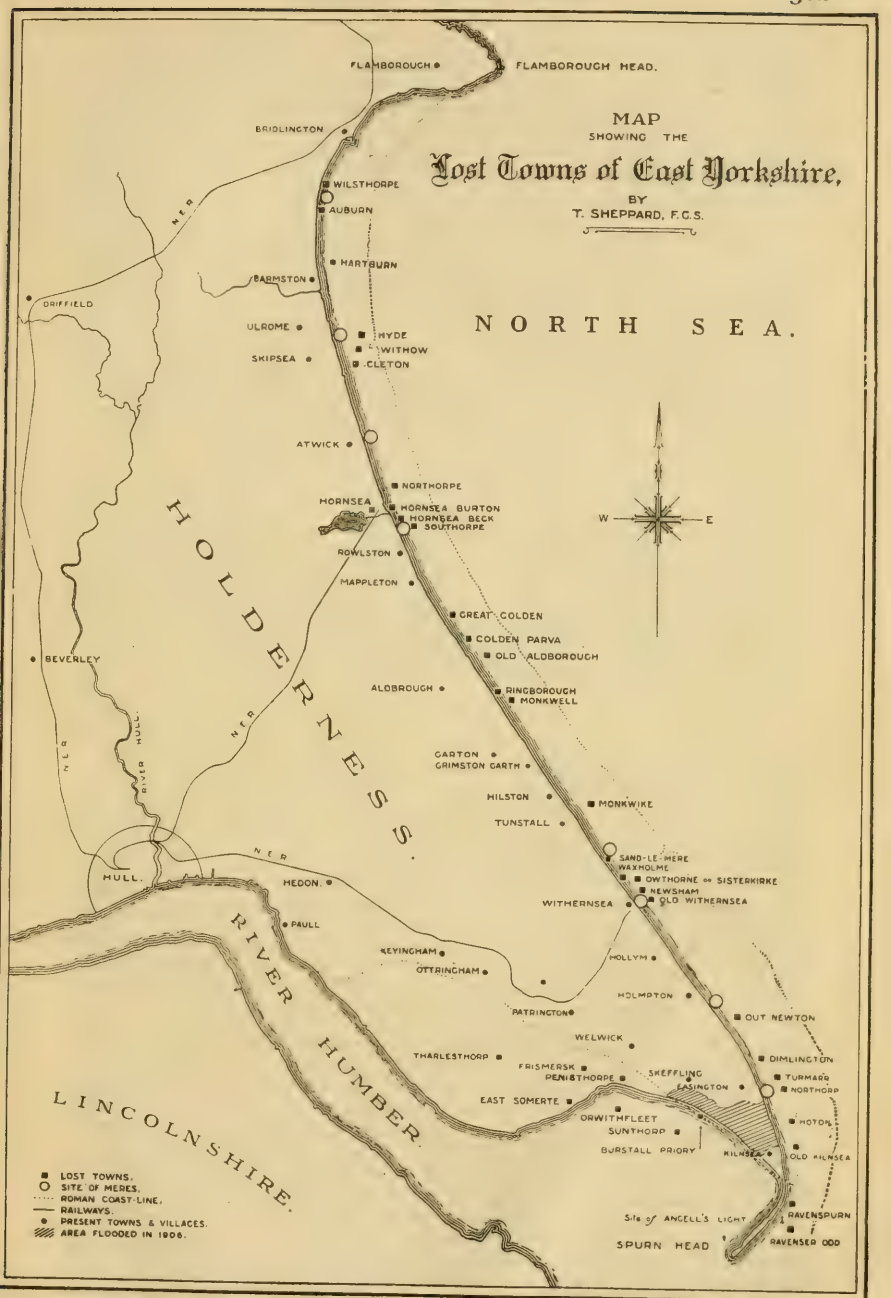
We were surprised to find from the publishers' announcement that 'here *probably for the first time*, we have a whole volume devoted to those curious excrescenses on leaves and branches which the wayfarer so often notices and so rarely understands,' and disappointed to find that in the author's preface no mention whatever is made of Connold's much more substantial work on 'British Vegetable Galls,' to which, with all due deference, Mr. Swanton must certainly be greatly indebted. Nor does Sir Jonathan Hutchinson, who provides an 'introduction' to the present volume, appear to be aware of its existence. From the very few and very casual references in the text, however, it is apparent that Mr. Swanton has knowledge of the earlier and larger work. Of course things might have been different if Connold were still among us; but though he is not here to speak for himself, we hardly think a later worker on the same lines and on the same subject, is justified in so pointedly ignoring what has been done before. After this grumble, which we feel necessary in memory of Connold, we can say that those who have not his work, and are interested in what Mr. Swanton calls 'Cecidology' (an odd word to escape from an 'Educational Museum') will do well to purchase the new book. There are nine chapters dealing with the various forms of galls, an extensive catalogue of British gall plants, a bibliography, and an index. There are several photographic and diagrammatic illustrations, including sixteen in colours by Miss M. K. Spittal. It is unfortunate that 'the line intended to serve as an index to the size of the insect is in all cases one-third in excess of the actual length,' especially as many may not notice the little note drawing attention to this rather important fact.

Insect Workers, by W. J. Claxton. Cassell and Co., 62 pp., 1s. net. By the aid of a number of well coloured plates, Mr. Claxton describes some of the more remarkable of our British insects, in a way that will appeal to the young scholar. He handles the subject in a popular manner, and refers to 'The Insect Tailor, Scavenger, Diver, Mason, Cigar-maker, Milkmaid, Carpenter, etc., etc.' There is even an insect nurse and an insect undertaker. It would make an excellent reading book for Schools.

The Teratology of Fishes, by James F. Gemmill, M.A., M.D., D.Sc., Glasgow: James Maclehose and Sons. 15/- net. This book deals with the monstrosities to which fishes are subject. Apart from abnormalities of a minor nature these are divided into Double Monstrosity, Triple Monstrosity, and Cyclopia, terms that are self explanatory, and the researches of the author throw much light on a little studied subject. Although the major type of monstrosity in fishes do not survive the period of nutrition by the yolk sac, still at the end of this stage the cartilaginous skeleton and practically all the other structures except the bony framework have been laid down in their final form and already exhibit their adult relations. It is surprising to learn the frequency of monstrosity in fishes, which seems to amount to one in every 250 eggs. Most of the observations refer to the trout and salmon, owing to the ease with which embryo material of these species can be obtained. Not the least valuable part of the work deals with the question of the causation of these "Siamese-twins" and other abnormal fish. The writer tends strongly to the opinion that the occurrence of double monstrosity is due in the main not to environmental factors, but to conditions which are inherent in the fertilised germ cell. The book is carefully and systematically written and contains all our present knowledge of this very interesting subject. It is well indexed, and, not least important, is illustrated by no fewer than 26 excellent plates after photographs. It should be read by all biologists.

The Lost Towns of the Yorkshire Coast and other Chapters bearing upon the Geography of the district, by **Thomas Sheppard, F.G.S., etc.** 320 pp. Large 8vo, with over 100 illustrations. Cloth Boards, price **7/6** net. London: A. Brown & Sons, Limited.

When it was announced that the author of that delightful book, 'Geological Rambles in East Yorkshire,' was about to bring out one on 'The Lost Towns of the Yorkshire Coast,' expectations of something very good were raised—and these have not been disappointed. Mr. Sheppard has written an extremely interesting book which appeals to the archæologist, the historian, the geologist, and certainly to every reading Yorkshireman. The subject is dealt with on broad and sympathetic lines. The Book is no mere dry record of barren facts and tiresome figures, but, while scrupulous in its scientific accuracy, is at the same time alive with human interest and cognisant of present day life and problems. To geologists generally, and especially to East Yorkshiremen, it is important to know that the past year has been marked by an enormous amount of coast erosion from Saltburn to Robin Hood's Bay, and in Holderness from Hornsea to Withernsea; according to a recent official report, 'the loss of land has been greater during the past year than for many previous years combined.' Mr. Sheppard has a great deal to say about this waste of land on the Yorkshire Coast, and ably discusses the causes of the waste and graphically traces on historical and geological lines its progress from prehistoric to modern days. Not the least interesting chapters are those on the 'Lost Towns,' the vanished churches, whose ruins now lie beneath the waves of the sea. The activity of long passed away populations are presented to our minds with pathetic and human interest. That facts and not fancies are the basis of the story is guaranteed by the numerous references to the 'Royal Commission on Coast Erosion, British Association Reports' and an extensive literature. The author has also had special



Specimen illustration from Sheppard's 'Lost Towns of the Yorkshire Coast.'

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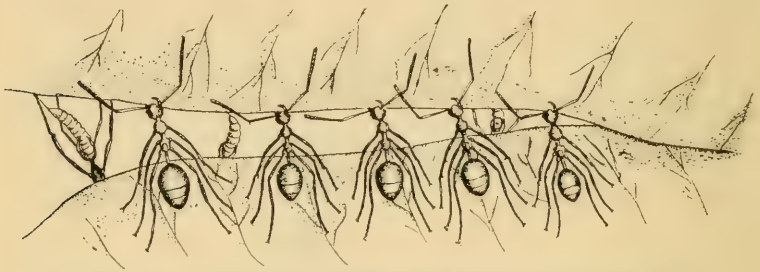
facilities for personal observations and access to people well acquainted with the actual phenomena of coast erosion by long residence on the Yorkshire Coast. Chapters on the Natural history of the Riding—on its extinct animals; its people, races, and dialect—on its antiquities and economics are well worthy of perusal by either student or ordinary reader. One charm of the book is that it develops its subject matter clearly and on evolutionary lines in well balanced proportion; the interest increasing from chapter to chapter. We have no hesitation in recommending the book alike to geologist, archæologist, historian, Yorkshireman and general reader. The paper, printing and illustrations are alike creditable to the publishers, Messrs. A. Brown & Sons, Ltd.,—W. Cash.

Ants: Their Structure, Development and Behavior. By **W. M. Wheeler**, New York. The Columbia University Press, 663 pp., 21/- net.

We have had this remarkable volume on our desk for some time, and have frequently dipped into its fascinating pages. There are also nearly three hundred illustrations, which alone give a more detailed account of the various species of ants and their habits than we have seen anywhere. Many of the particulars of their habits are almost unbelievable. Dr. Wheeler has unquestionably produced one of the most remarkable scien-



Brigade of *Œcophylla smaragdina* workers drawing edges of leaves together while other workers bind them together with the silk spun by the larvæ.

tific books that have appeared for many years. In addition to the descriptions of the various species of ants, their societies, organisations, etc., he deals fully with fossil ants, ant nests, relations of ants to vascular plants, fungus-growing ants, sanguinary ants, slave making ants, etc., etc. There also are appendices dealing with methods of collecting, mounting and studying ants, Key to the North American Species, List of Described North American Ants, Methods of Exterminating Noxious Ants, and a Bibliography. The last item is a wonderful achievement. It contains seventy closely printed pages containing many thousand references to monographs and papers. We reproduce one of the illustrations herewith.

The Evolution of the Vertebrates and their Kin. By **William Patten, M.D.** London: J. & A. Churchill, 1912, 486 pp., 21/- net.

Professor Patten, who is the head of the Department of Biology in Dartmouth College, Hanover, has made an important and distinct contribution to our knowledge of the origin and evolution of the vertebrates. These abruptly make their appearance as fully formed fishes, at the close of the Silurian or the beginning of the Devonian. They were evidently more highly organised than any of the invertebrate types that had appeared up to that time, and they must have arisen, either by a marked transformation of some of the known, pre-existing types, or from some extinct and totally unknown ones. On either supposition the apparent absence of transitional forms is surprising, since the relatively large size, distinctive form, and well developed skeleton of primitive vertebrates, under the

known conditions, should leave behind some recognizable traces of their predecessors in the form of fossils. Dr. Patten makes a bid for the arachnid theory of the origin of the vertebrates, and the first two chapters in his book contain elaborate analyses shewing that beneath a heavy disguise of contour and surface detail, the structural plan of an arachnid and of a primitive vertebrate are after all the same, and that there is a great similarity between various types of adult arthropods and the vertebrates. In a most convincing manner Prof. Patten, by the aid of beautifully drawn diagrams, carries us step by step in support of his theory. Of these diagrams there are several hundred, which have been specially prepared, and they alone form a most important contribution to Zoology. Judging from his list of papers, the author has paid particular attention to the histology of that great marine arachnid, the *Limulus*, usually known as the King Crab, and this has served him in good stead in his subsequent researches. Whether we look upon Prof. Patten's volume from the point of view of palaeontology, zoology, or evolution, it is a welcome addition to our shelves.

Life : its Nature, Origin and Maintenance. E. A. Shäfer, LL.D., etc. London : Longmans, Green & Co., 36 pp., 1/-

Except that the preliminary matter given at Dundee is omitted, this essay is essentially the presidential address delivered to the British Association in September. Seeing that this address, as well as the presidential addresses delivered to all the sections, have for some time been on sale for a shilling, it is difficult to understand what object there is in selling it separately in this form. We are not quite sure, also, whether anyone is quite justified in publishing the address in this way before the appearance of the annual report of the British Association, unless of course, the council gave the necessary permission. If they did, no reference is made to the fact. In the present edition (which oddly enough is advertised is the only ' authorised ' edition) the type is no larger than in the original address. With regard to Prof. Shäfer's views as expressed in the pamphlet, we have already given our opinion in these columns.

RECENT PERIODICALS.

Among the recent periodicals we are glad to notice part XII (2s 6d. net) of Major Barrett-Hamilton's **History of British Mammals**, which is entirely devoted to particulars of the Common or Brown Hare, and the Mountain or Blue Hare. The descriptions, details of distribution, etc., are most carefully prepared, and there are some suitable plates, including one in colours. **The Nature Book**, issued in fortnightly parts (7d. each), by Messrs. Cassell, has reached part 18, which includes well illustrated papers on ' The Flowers of the Hedge Climbers,' ' How to know the Birds,' 'The Grass of the Waste Places,' ' How to know the Reptiles,' ' The Story of a Snowflake,' and ' How to know the Trees.' Each part of this interesting publication contains a good variety of matter, by well-known writers. Part VIII of S. S. Buckman's **Yorkshire Type Ammonites** (Wesley and Son, 3s. 6d.) completes the first volume of this valuable monograph, in which sixty-seven species of ammonities are described and illustrated. Of these the majority, it may be claimed, were known to science only by name, and hardly by that. Part VIII contains figures, etc., of *Ammonites puteolus*, *crassiusculosus*, *annuliferus*, *anguiformis*, *owenensis*, *simpsoni*, and *denotatus*. From Messrs. Hutchinson and Co., we have received part I. of **Customs of the World**, which is to be completed in about 26 fortnightly parts at 7d. net each. The work is a popular account of the customs, rites and ceremonies of men and women of all countries, in connection with birth, courtship, marriage, religion, superstition, death and burial. The part before us is remarkably cheap, and contains several extraordinary illustrations from photographs, as well as some coloured plates. When complete *The Customs of the World* will unquestionably form a most valuable contribution to anthropology.

PROCEEDINGS OF PROVINCIAL SCIENTIFIC SOCIETIES.

The Annual Report of the Huddersfield Naturalist, etc., Society for 1911-12, contains a record of the Society's work in photography, antiquities, zoology, geology, etc. A strong feature is made of the local records. A new antiquarian section has been formed during the year. It is a pity the pages of the report are not numbered.

Proceedings of the Cheltenham Natural Science Society. N.S. Vol. 2, part I, October, 1912, 142 pp., 1/-.

This publication contains the presidential address of Dr. E. T. Wilson on the Flora and Fauna of Great Britain and Ireland, when and whence did they come? ; and a paper on 'The Plant Geography of England,' by Miss C. L. Laurie. There are also reports of excursions, with illustrations.

The elaborate quarto **Transactions of the Leicester Literary and Philosophical Society,** Volume xvi, 1912 (71 pp., 2/6) shew that this society is apparently developing the 'literary' side to the detriment of the 'philosophical.' The two papers printed in the publication are on Some Thoughts on History, and the Greek Novel, respectively, while the reports of Sections, which formed such a useful feature in the former more handy octavo publication of this society, have dwindled to mere lists of officers and excursions,

In the **Annual Report of the Hull Borough Analyst,** recently issued, reference is made to the fact that 133 rats were examined, pathologically and bacteriologically, during the year. Sixteen per cent. were found to be affected by diseases of some kind, but none with the plague. The report concludes 'It is sometimes stated that the old English black rat is extinct in this country. My results show that this is not so, as 35 per cent. of the rats examined were black Alexandrine or old English house rats, and 65 per cent. were Norwegian grey rats, or common sewer rats.'

Transactions of the Hull Scientific and Field Naturalists' Club. Vol. IV., part iv., 1912, pp. 187-230, 2/- net.

Besides an excellent report of the Club's work during the previous year, this publication contains a valuable paper on the Diatoms of the Humber, by the late R. H. Philip, 'In Memoriam' notices of that naturalist by Messrs. J. F. Robinson and E. Lamplough, a note on East Yorkshire Conchology by Mr. J. W. Boult, and an elaborate paper on 'Glimpses of old Hull in the light of recent excavations', by the editor, Mr. Sheppard. This is illustrated by photographs, etc., of two hundred objects.

The Annual Report of the Yorkshire Philosophical Society for 1911, besides containing particulars of the additions to the York Museum, includes the usual meteorological report, an elaborate and well-illustrated paper on the Roman Pottery in the York Museum, by Mr. T. May; Notes on Fire Insurance Marks by Dr. C. K. Hitchcock; the opening of a Tumulus near Pickering, by Mr. J. L. Kirk, (when the author and a friend 'set out to try our luck at opening a barrow'—a curious object!); a note on an inscribed Roman slab recently found at York, by Mr. H. M. Platnauer, and a reprint of Dr. Tempest Anderson's paper in the *Geographical Journal* on "Volcanic Craters and Explosions.'

Journal of the Derbyshire Archaeological and Natural History Society. Index: Vols. I-XXV. 235 pp.

We are informed on the title page that this Index was 'prepared before his death by the Hon. Fredk. Strutt,' and printed by Messrs. Bemrose and Sons, Derby. This society has issued a large amount of valuable information dealing with the geology, archaeology and natural history of the county, and there can be no doubt that the present index will make these publications more accessible and valuable. Unfortunately the index is merely alphabetical, and there is no subject index. Thus, judging from the Index, there has apparently only been one article on geology, and one on birds, in the whole twenty-five volumes.

NEWS FROM THE MAGAZINES.

An illustration of a hybrid between an Eider and a Wild Duck appears in *The Scottish Naturalist* (No. 9).

A new Lancashire Lichen, *Stenocybe byssacea*, is recorded by Mr. J. A. Wheldon in *The Lancashire Naturalist* for October. It occurred on the twigs and branches of *Alnus glutinosa*, near Caton, West Lancashire.

We have received part I of a well-printed and curiously illustrated magazine, *The Technicalian*, issued by the Hull Technical School. The only 'natural history' item we can find in it is 'Algy met a bear; The bear was bulgy; The bulge was Algy.'

Messrs. W. A. Parker and W. H. Sutcliffe do not like the views expressed by Messrs. H. P. Kendall and H. Ling Roth in the pamphlet on 'Local Prehistoric Implements,' published by the Halifax Museum, and in the September *Lancashire Naturalist* write to some length on the subject.

In the *Irish Naturalist* for October, Professor C. J. Patten has a paper on 'Spotted Flycatchers on Migration observed at the Tuskar Rock and Lighthouse,' and in the November issue of the same journal he records the Tree-pipit on the Tuskar Rock, this bird being an addition to the Irish list.

The Scottish Naturalist (No. 9) contains an interesting criticism of the recently published *List of British Birds*, and also points out that 'in a great number of instances the journal *British Birds* is quoted as if it were the original source of publication of interesting records, which is not the case.'

From the Viking Club we have received two parts of their *Old Lore Miscellany* of Orkney, Shetland, Caithness and Sutherland, and a part of *Orkney and Shetland Records*. These publications contain a valuable record relating to the northernmost parts of our islands. There are also reviews of books bearing on the district, and a Bibliography.

In the *Scottish Botanical Review*, Mr. Arthur Bennett refers to *Saxifraga Hirculus* L., and its distribution in the British Isles. In this he refers to a record for Sedbergh, by J. Handley, in *The Naturalist*, for 1903 (pp. 408). Since then, however, Professor Oliver has informed Mr. Bennett that he saw Mr. Handley's specimen, and it was not *Hirculus*, but *aizoides*.

In *The Entomologist's Monthly Magazine* for November, Mr. Porritt gives a 'description of the larva of *Luperina gunneei*,' from St. Anne's-on-Sea. In the same journal Mr. Claude Morley identifies the much-talked-of 'humming in the air' on summer evenings, as due to small flies, *Tanypus varius*, and *Chironomus dorsalis*, though what the evidence is that both the species make the sound, is not stated.

It appears from Mr. C. D. Soar's notes in *Knowledge*, for November, that the adult Harvest Mite has never been identified. It may be known; but as the six-legged larval stage is the one which causes the well-known irritation when it burrows under the skin of human beings, and its life history has never been followed out, it is impossible to say what the eight-legged creature into which it ultimately grows is like.

Bedrock, the new quarterly, issued by Messrs. Constable and Company, contains a paper by Dr. Keith, on 'Recent Discoveries of Ancient Human Remains and their bearing on the Antiquity of Man.' We observe that Dr. Keith considers that further discoveries will shew that Mr. Moir is right is stating that the Ipswich skeleton occurred beneath undisturbed boulder clay, notwithstanding the opinions of well known geologists the contrary. Dr. Gossage writes on 'Human Evidence of Evolution,' and there are several other inportant papers. *Bedrock* is sold at half-a-crown.

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COMPILED BY W. E. L. WATTAM.

It is not an index in the strictest sense of that term, but it is a classified summary of the contents of the volume, arranged so as to be of assistance to active scientific investigators, the actual titles of papers not always being regarded so much as the essential nature of their contents.

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CORRIGENDA.

Plate XIII, *for* "cobatus," *read* "lobatus."
Page 103, line 4, *add word* "later" *after word* "Williamson's."
Page 126, line 12, *for* "myusoroides," read "myosuroides."
Page 126, line 13, *for* "pterogophyllum," *read* "pterygophyllum."
Page 126, line 34, *for* "Cheeeham," *read* "Cheetham."
Page 172, line 7, from bottom, *for* "æcidia," *read* "teleutospores."
Page 206, line 14 from bottom, *omit* the word "Not."
Page 217, line 28, delete asterisk sign before record of Tornatina obtusa, and mark with dagger sign.
Page 268, line 3 from bottom, delete dagger sign before the word "Ash."
Page 269, line 7, delete asterisk before the word "Composition."
Page 290, line 7 from bottom, *for* "10/6" *read* "7/6."
Page 296, line 18, *for* "genexa," *read* "genera."
Page 297, line 8, *for* "need," *read* "meed."
Page 292, line 22, *for* "Authocyan," *read* "Anthocyan."
Page 320, line 26, *for* "tubuler dnct," *read* "tubular duct."
Page 323, line 9, *for* "central," *read* "ventral."
Page 349, line 24, *for* Anthropods," *read* "Arthropods."
Page 326, line 30, *for* "Telegraph," *read* "Chronicle."

HELIX PISANA Müller.

1–3. *Helix* (*Euparypha*) *pisana* Linné.
Tenby, A G. Stubbs.

4. *H. pisana* var. *picta* Taylor.
Tenby, A. G. Stubbs.

5. *H. pisana* var. *dentata* Taylor.
Mogador, G. K. Gude.

6. *H. pisana* var. *semifulva* Taylor.
Mogador, G. K. Gude.

7. *H. pisana* var. *tenuis* Taylor.
Tenby, J. W. Storey.

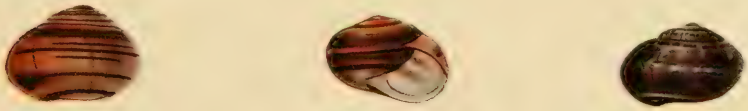
8. *H. pisana* s.-v. *magnifica* Monts.
Viareggio, Marquis Monterosato.

9. *H. pisana* var. *grasseti* Tarnier.
Las Palmas, Canary Islands.

10. *H. pisana* var. *diaphana* Bourg.
Tenby, A. G. Stubbs.

11. *H. pisana* var. *rosea* Costa.
Golita, Tunis (Brit. Mus.).

12. *H. pisana* var. *concolor* Moq.
Mogador, G. K. Gude.



13. *H. pisana* var. *ferruginea* Moq.
Golita, Tunis, G. K. Gude.

14. *H. pisana* s.v. *adusta* Monts.
Tunis, Marquis Monterosato.

15. *H. pisana* var. *testudinea* Monts.
Chioggia, Marquis Monterosato.

16. *H. pisana* var. *lineolata* Moq.
Algiers, P. Dautzenberg.

17. *H. piasna* s.-v. *musica* Monts.
Palermo, Marquis Monterosato.

18. *H. pisana* s.-v. *bilineata* Monts.
Viareggio, Marquis Monterosato.

19. *H. pisana* s.-v. *punctella* Moq.
Algiers, P. Dautzenberg.

20. *H. pisana* var. *undulata* Taylor.
Golita, Tunis (Brit. Mus.).

21. *H. pisana* s.v. *delicata* Monts.
Palermo, Marquis Monterosato.

Yours truly
M. Davidson

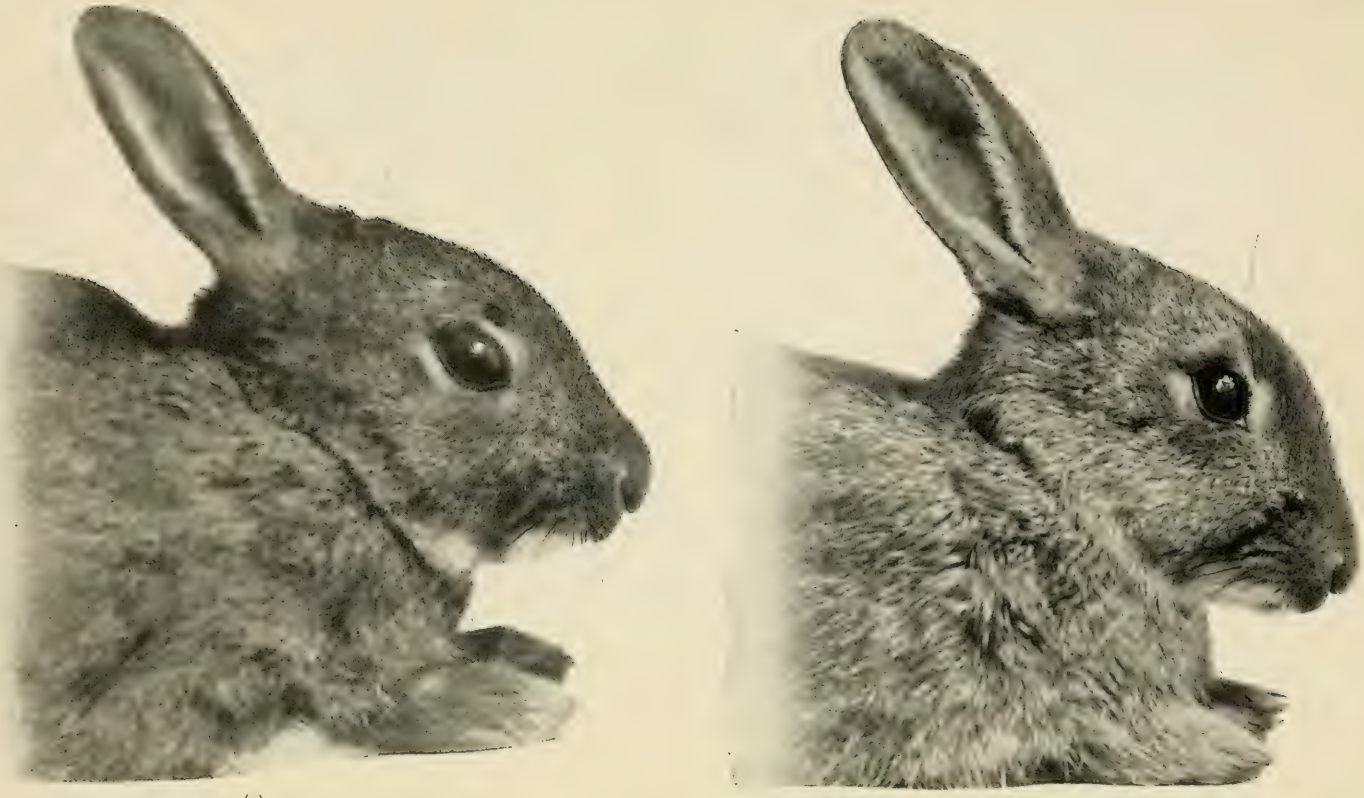
Pithecanthropus.

(From Knipe's 'Evolution in the Past').

Driven off the Hill. (From "The Red Deer": Longmans & Co.).

The Beggar's Oak, Bagot's Park.

The Gun-barrel Oak, Bagot's Park, Needwood Forest.



(*a*) (*b*)

Head of (*a*) **Male and** (*b*) **Female Rabbit.** (From Major Barrett-Hamilton's *History of British Mammals*).

Photo by] [*Payne Jennings.*

A view of Hornsea, from the Pier now washed away.

Photo by] [*Barr.*

The old 'Promenade' at Hornsea, after the high tides of March, 1906.

Photo by] [*H. S. Harker.*

South Cliff Cottage, Hornsea, about 200 yards south of the Mere stream.
The position of the old road can be seen between the house and the shed.

Photo by] [*F. H. Wood.*

Hornsea, showing delapidated groyne.
The peat deposit is in the foreground.

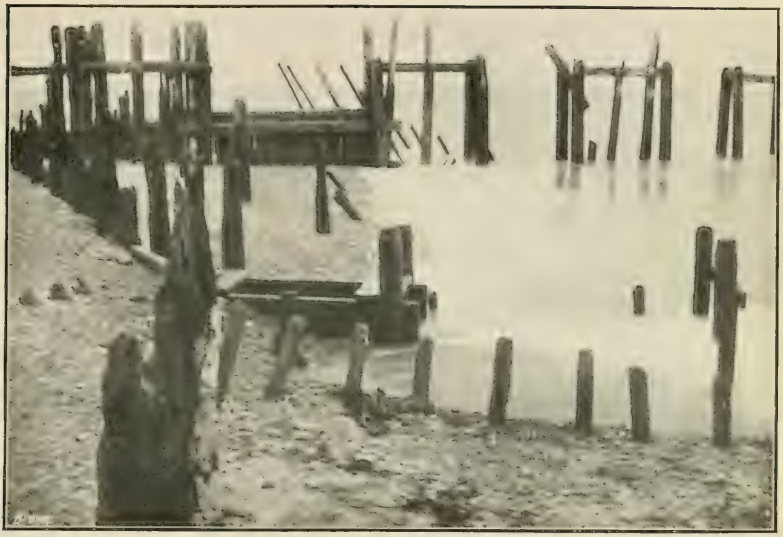


Photo by] [*H. S. Harker.*

The seaward end of the Mere Stream, or 'Stream Dyke,' Hornsea.

Photo by] [*H. S. Harker.*

The remains of an embankment erected about fifty years ago, at Hornsea, by the late J. A. Wade.

Photo by] [*H. S. Harker.*

The last remnants of the sand-bank south of Hornsea; 200 yards south of the remains of the pier. February. 1912.

Photo by] [*H. S. Harker.*

Nearer view of the remains of the old sand-bank, Hornsea. February 1912.

Photo by] [*J. W. Stather.*

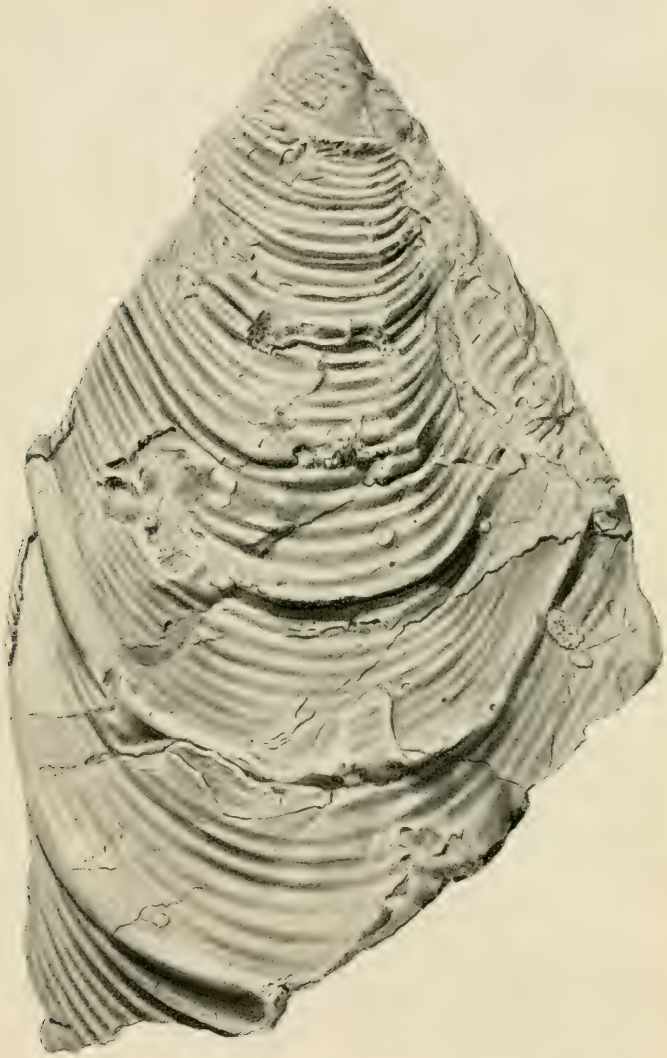
The site of the old Mere, Hornsea.

Photo by] [*J. W. Stather.*

Peat containing fresh-water remains. being part of the bed of the old Mere, Hornsea, 1906.

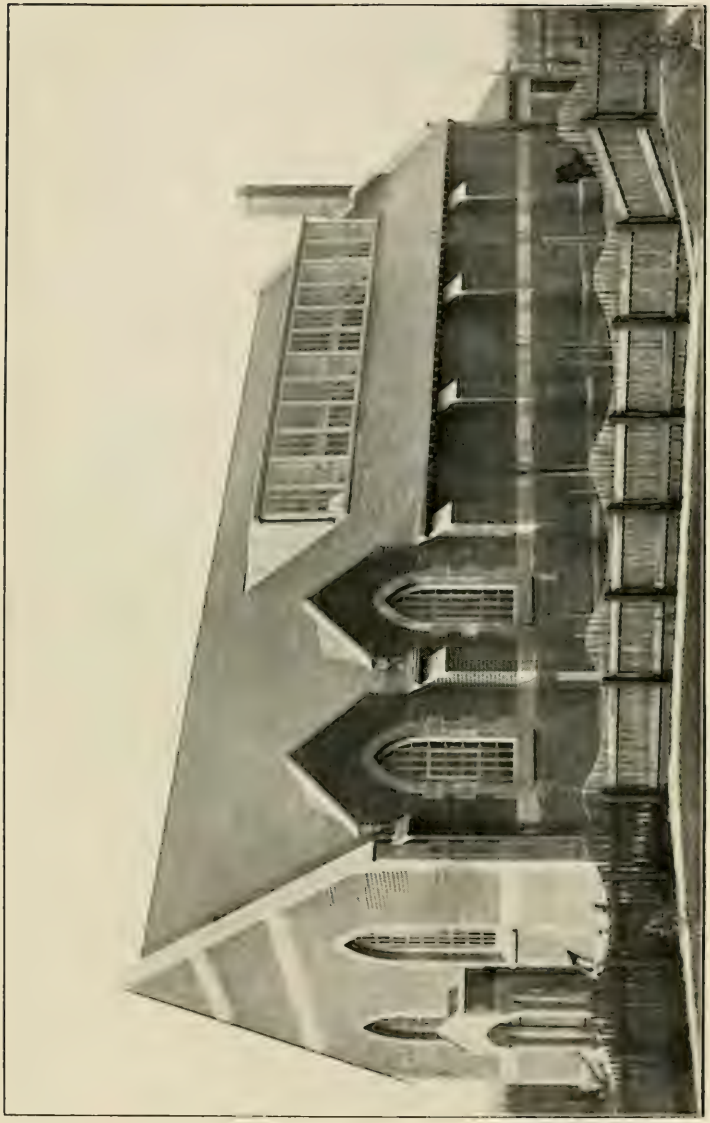
Great Auk and Egg.

(Formerly the property of Sir William Milner, Bart. The bird was bought for £350 for the Royal Scottish Museum at Edinburgh, and the egg was purchased by Mr. T. G. Middlebrook for £189).

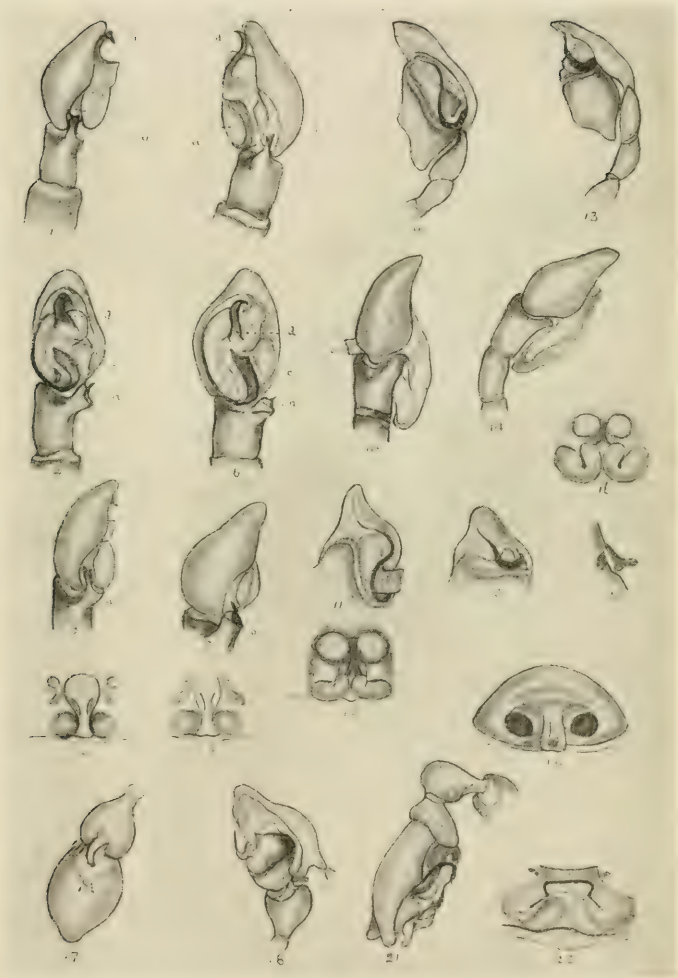


***Inoceramus iobatus* Goldf.**

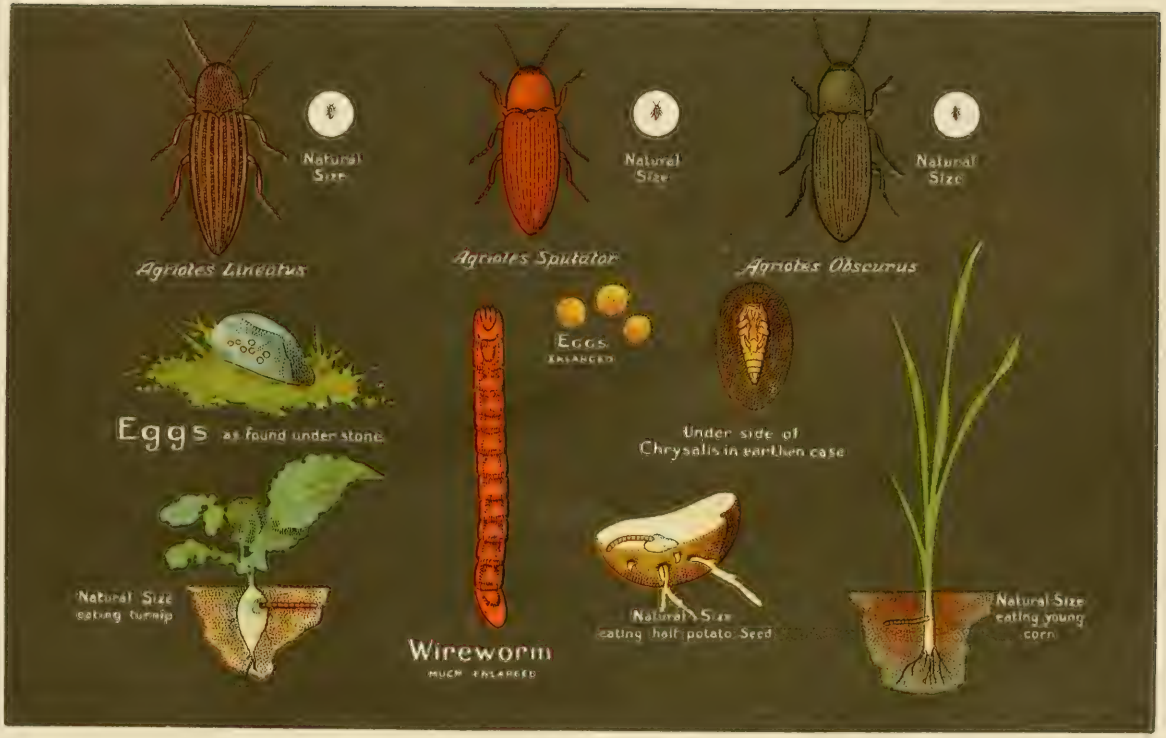
Zone of *Actinocomax quadratus*, Yorkshire. York Museum. Part of left valve. $\frac{2}{3}$.



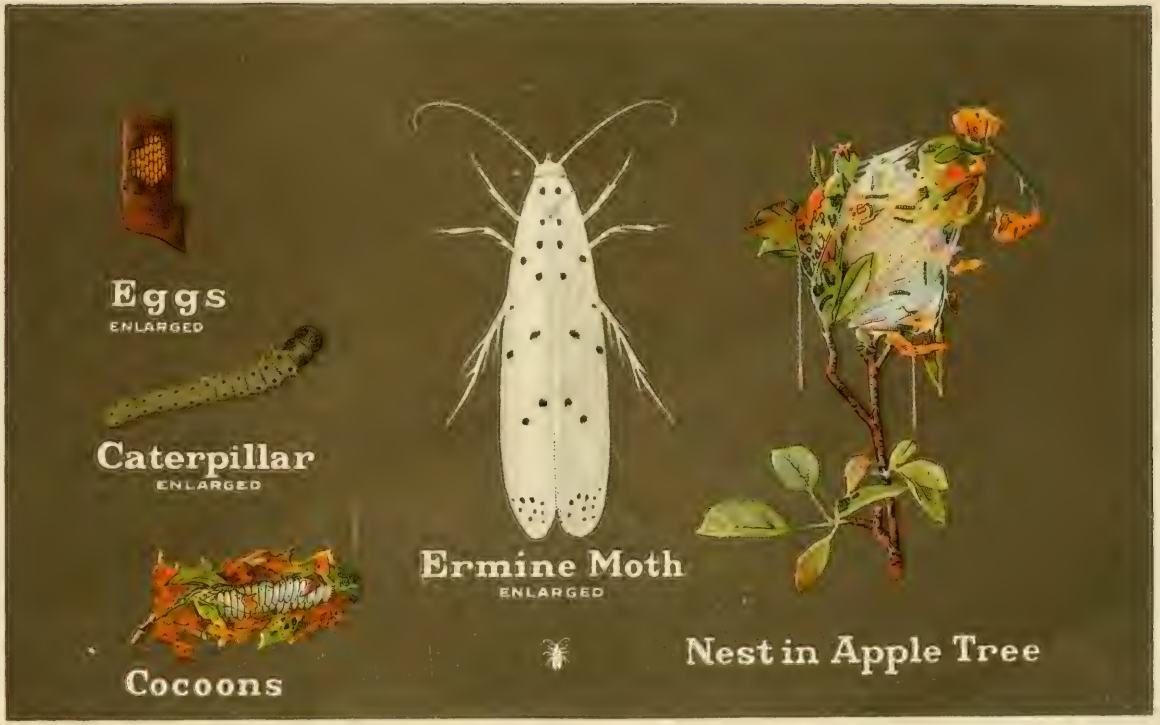
Museum of Fisheries and Shipping, Hull.



Parts of new Spiders, etc. (For description see pp. 310-324).

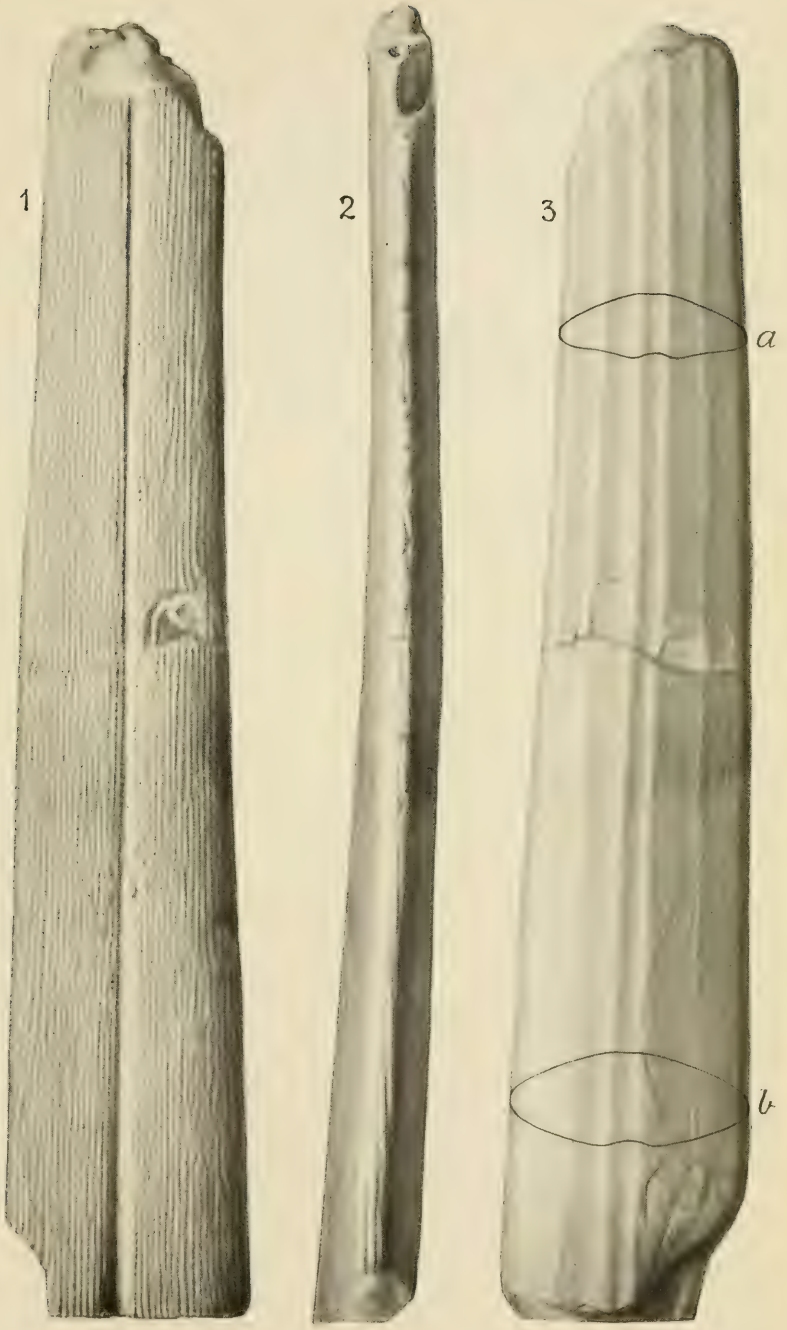


Wireworms—Click Beetles or Skip Jacks. (Reduced from Browns' Wall Charts). (See page 303).



Small Ermine Moth. (Reduced from Browns' Wall Charts). (See page 303).

Sir Charles Lyell at the age of 73.



G. M. Woodward, Del.

Protosphyræna stebbingi, A. S. Woodw., from the Chalk of Lincolnshire.

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